# MEDICINE IN ITS SETTING *

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All the more need, I think, that those of us who practise medicine—even though we are derided as Victorian hangovers—should allow the principles of scientific humanism to determine our thought and conduct today. We should pronounce a belief in the importance of the great human values and cherish the hope that science can help man to define and to achieve these objectives, both by controlling his environment and by increasing his knowledge of himself. Events are moving swiftly, and if in our day there has seemed to be too much science and too little humanism, medicine and its associates are working—fallibly and falteringly—to prevent some of the foreseeable disasters for mankind.

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Medicine has a much clearer view of its responsibilities towards society than it had thirty years ago. We have been compelled to move quickly, if not yet with as much foresight as the situation requires. Even the physician in the fastness of his consulting-room has become aware of a change in his own reactions. For example, the now accepted criticism that medicine should by this time have been able to prevent the common cold seemed to us a slightly derisory demand a generation ago. René Dubos in his splendid book *The Mirage of Health* quotes the words of a physician that "it is part of the doctor's function to make it possible for his patients to go on doing the pleasant things that are bad for them—smoking too much, eating too much, drinking too much . . ." Certainly, it was a surprise to us in consulting medicine to find that these behaviour disorders did not disappear by a five-guinea blast on our therapeutic trumpet. And we began to observe that the correction of these bad habits was not easy for ourselves, unless our personalities had a touch of the masochist and the obsessional about them. Later we became aware that diagnosis and prevention, at which we might make a shrewd guess in the individual, could only be determined for the community by population studies. The departments of social medicine were ready to apply these techniques, and the Birmingham department has initiated many valuable inquiries, as have others in the school, notably J. H. Sheldon and Sir Arthur Thomson.

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* From an inaugural lecture delivered in the University of Birmingham on May 13, 1960.

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that the causes of such widespread diseases have been defined. René Dubos makes this point well, and he instances the fact that improved sanitation was preventing infectious disease long before anything was known of bacteria. A minor example of social action in advance of scientific proof was provided by the manufacturers of teething-powders who removed the mercury from their products before the scientists were convinced that the association of mercury with pink disease had been completely demonstrated—with the consequent disappearance of pink disease from the community.

It may surprise my non-medical listeners to know that we are quite unaware of what constitutes optimal nutrition. We are moving rapidly to maximal nutrition, so that we are growing taller and heavier in every decade, and puberty is being reached at still earlier ages. Nobody has yet forecast how far this process will carry us, but already we can define the social difficulty which it creates; for sexual maturity has perforce to be matched to the educational and economic retardation imposed by our society. These are psychological and social problems, but there may well be physical dangers involved in the maximal nutrition which we are on the way to attain.

Medicine has had many an attack of conscience in recent years with the recognition that it has itself unwittingly created hazards for mankind. We no longer take the Hippocratic Oath but its clauses have been built into our traditions :

> " I will use treatment to help the sick according to my ability and judgment, but never with a view to injury and wrongdoing. Neither will I administer a poison to anybody when asked to do so, nor will I suggest such a course."

We have erred in my own field of pædiatrics in which by the excessive administration of some drugs (e.g., vitamins D and K) and by the unnecessary administration of others (e.g., mercury) we have ourselves created disease when engaged in preventing it. So severe has this lesson been that the Americans have given these doctor-engendered disorders a name—iatrogenic diseases. (The Americans follow the Greeks in " having a word for it".) These unhappy experiences should not encourage in us an excess of caution. If a drug or an operation is likely to benefit our patients, then clearly the risks attendant on the treatment have to be assessed, acknowledged, and accepted. All that our patients ask is that the treatment should be applied with all available skill, and with an awareness of its dangers.

Society asks of medicine, then, more foresight in the appreciation of the hazards for mankind, and more humanism in the design of our therapeutic programmes, both for the individual and for the community.

### The Place of Medicine in the University

It is a truism, at least in medical circles, that medicine has a central position in a university, standing between the two cultures of art and science, having long established itself as a practical art, and being now in process of becoming an applied science.

If medicine, however, wishes to make this claim, it is well for us to recognise the limiting factors in our position. We should not wish to base this opinion on the fact that one encounters more doctors in the university staff club than members of any other faculty. And it would obviously be excessive to regard ourselves as especially fitted to promote good relations in the university corpus. Francis Bacon defined the Office of Medicine as " but to tune this curious Harp of man's body and to reduce it to Harmony ". Medicine has no call to apply group psychotherapy to the " curious harp " of university life in order to reduce it to a discreet harmony.

If indeed the position of medicine is central, then pure science is far out on the left wing and the fine arts away on the right wing (no political connotations are intended by these fanciful descriptions). The number of departments with which medicine collaborates is steadily increasing. This is not only due to the extension of our own applied science towards physics, chemistry, genetics, microbiology, and zoology, but sometimes, as in the organ analysis of the chemists, because the scientists are taking an increasing interest in us.

But this great bulge of medicine is increasingly towards the left, and our contacts with our friends in the arts are disappointingly meagre. Social studies, education, and physical education—the list is a short one; and these are subjects, like our own, in which method is being applied to the study of man in his environment.

The need for a bridge between the Two Cultures—as C. P. Snow dubbed them in the Rede lecture of 1959—cannot be denied; and yet I have found plenty of evidence in Birmingham, and I do not doubt that it could be found also in Cambridge, that the position is not quite so desperate as Sir Charles Snow pictured it. The scientists use their books as tools, it is true, but they read also to " enter another world than theirs "; and you will readily appreciate that the wheel has come full circle now that scientists are devising jokes about their own illiteracy, just as the Aberdonians, most generous of Scotsmen, delight to tell stories of their meanness. You will recall the anecdote of the scientific visitor at Harwell who, when asked to sign his name, put two crosses in the book. " Why the second cross? " asked the receptionist. " That's my PH.D.," proudly replied the scientist.

Nor should we underestimate the capacity of the artists—historians, painters, musicians, theologians, English scholars—to understand what the scientist is talking about. Arnold Bennett read *Nature* every week and claimed that he understood enough to make it worth his while to do so. My friend and colleague, T. J. B. Spencer, in his brilliant inaugural lecture, dealt with *The Origin of Species*, *The Descent of Man*, and *The Decline and Fall of the Roman Empire*, and proved that a professor of English may understand the significance of historical and scientific works as well as, or better than, do the historians and scientists themselves.

In Snow's analysis of the gap between the Two Cultures there seems to be some confusion between the understanding of the scientific steps which are required to arrive at a conclusion, and a comprehension of the significance of the conclusion itself; it is not necessary to understand the former before one can comprehend the latter. Proponents of the Two Culture theory omit a further consideration. When a major and radical scientific hypothesis is first propounded—such as Einstein's relativity, or Yang and Lee's contradiction of parity (used by Snow as an index of the failure of communication between Science and the Arts)—only a few men in the whole world understand it; but in ten years it becomes part of the honours course curriculum, and by this time its importance in the scheme of things can surely be communicated to theologians, to musicians, and to doctors. What was a pioneer climb for the skilled mountaineer becomes, in C. E. Montague's phrase, " an easy day for a lady ". Fortunately our scientists have not disdained

the practice of communication. Eddington, Jeans, Julian Huxley, Hoyle, and Medawar have all been ready to explain to the artist and the common man "the way of a serpent on a stone, the way of a ship on the sea, and the way of the stars in the heavens".

Nevertheless there is a need for improved communications within the university and this is recognised in Birmingham. It is hoped, for example, that the newly established second chair of theology will be taken by a professor who is cognisant of the major conclusions of science. There is now in the university a Broader Education Course for all undergraduates at the conclusion of their summer examinations. Such a scheme is indeed no more than a laudable therapeutic attempt to correct the educational atrophy which has developed in the schools as a consequence of the unnatural hypertrophy which was itself induced by university requirements. I am sure that the Crowther report *15 to 18* and the Gulbenkian report by A. D. C. Peterson of the Oxford University Education Department have been well studied in the faculties of the university. Both reports plan the reform of the 6th forms, one of their objects being to give us a student with a better general education. In medicine, we should be delighted if our students could have reached advanced levels in English, in mathematics, in one language, and in one scientific subject (physics or chemistry) before they undertook their work for the 1st M.B. I cannot see how this can be achieved unless our students come to their medical studies one year older than they do today, and for my part I think this must be accepted. If the money is there, and if the teachers, the classrooms, and the laboratories are there, the practice of medicine in this country would be greatly improved by the wider and deeper education of our students before they reach us. We are by no means alone among university departments in complaining that our students are inadequately educated. Such a reform of 6th-form education should do something to diminish the dangers of the "cultural divide" of which C. P. Snow has written, for this cultural division begins in the higher forms in our schools.

It is vain to hope that there will ever be a completely interchangeable language even among scientists themselves. For example, I am told that the physicists do not comprehend fully what the mathematical physicists are saying. The day of the universal scientist is over. The field is both too vast and too detailed and time is denied us. I have just been reading a book, *Significant Trends in Medical Research*, which describes an experiment in communication between medical scientists. Ciba House, to celebrate its tenth birthday, invited 30 distinguished medical scientists, among them 7 recipients of Nobel prizes, to listen to twelve papers describing advances in medical science. Although the experiment was a success, an analysis of the discussions shows that universal comprehension was not achieved. It could not have been expected, for example, that the physicians present would enter freely into a debate on molecular structure or on the chemical basis of virus multiplication. And yet there were many indications that, if the practice of communication is conscientiously pursued, improved understanding will come. Sir Harold Himsworth suggested at the symposium that medicine and its neighbouring sciences are rapidly becoming one "intellectual continuum". Here a common language is becoming a professional necessity.

Medicine, I conclude, has moved to the left, in this generation, away from the arts. If it seeks to regain its central position in the university it will have to work its passage to the right. A better general education for our medical students would help. A conscientious practice of communication and, even more important, a willingness to listen to voices other than our own are required. In the expansion of the university, medicine should stimulate the Enlightenment † to call in the Old World of the arts to redress the balance of the New World of science. I hear exciting talk of a new chair of architecture, a department of drama, and the building of a theatre. Those who view these developments with tepid appraisal may listen to the Sage of Edgbaston speaking a hundred years ago: The practical end of a university course, he wrote,

> "is that of training good members of society. Its art is the art of social life, and its end is fitness for the world. . . . It does not promise a generation of Aristotles or Newtons, of Napoleons or Washingtons, of Raphaels or Shakespeares, though such miracles of nature it has before now contained within its precincts. Nor is it content on the other hand with forming the critic or the experimentalist, the economist or the engineer, though such too it includes within its scope. But a University training is the great ordinary means to a great but ordinary end; it aims at raising the intellectual tone of society; at cultivating the public mind, at purifying the natural taste, at supplying true principles to popular enthusiasm and fixed aims to popular aspiration, at giving enlargement and sobriety to the ideas of the age, at facilitating the exercise of political power, and refining the intercourse of private life."

Although I think John Henry Newman might well have been surprised by the "fitness for the world" displayed by our science graduates, yet we cannot hope that our modern universities will produce the cultivated man of Newman's dream unless they given an enhanced importance to the faculties of the arts. Medicine, perhaps more than any other profession, has need of the cultivated man and the good citizen. Here its position in the university, if not central, is at least focal.

### The Internal State of Medicine

May I add a few final words about the internal state of medicine? If you have agreed that the end of university education is to produce a good member of society, I hope you may agree too that the object of the medical course is to make a good doctor. This will appear to many of you to be so obvious an ideal as to be unworthy of emphasis. But it carries with it some important conclusions. It implies that, whether a medical student later becomes a general practitioner, a medical scientist, a surgeon, or a statistician, he is first trained to be a good doctor; that he learns both the method of science and the way of humanism; that he is taught how to handle the bodies and minds of sick people, whether he is to earn his living in a laboratory, in an insurance office, or in the homes of his patients; that we do not require two or three different sorts of medical education; and that there are no grades in the medical hierarchy. The fact that only 30% of our students become general practitioners is therefore not a matter for congratulation (moreover the country requires many more of them for a better family-doctor service); nor should it have any effect on our plans for the medical curriculum (despite the recommendation of the Goodenough Committee in 1943). When we discuss the medical curriculum, it is important to know what sort of a doctor we are setting out to make. The splendid report of the Medical School Planning Committee for

† I use Enlightenment, rather than the Establishment, to describe our University rulers—a name that should encourage both the governors and the governed.

Rhodesia and Nyasaland ‡ owed some of its success to the fact that the committee had a clear notion of the kind of doctor the Federation required.

When I assert that the purpose of medical education is to produce a good doctor, I mean by a good doctor a man or woman who is well aware of diagnostic possibilities, who knows what treatment should be given and who should provide it (whether he or another), who is quick to understand our changing human situation—one who carries charity in his heart and who is not repelled by the quirks, the follies, and the vices of mankind. I take it that this good doctor is well fitted to be the "personal doctor" of whom Dr. Fox was writing in *The Lancet* a few weeks ago. I meet him, as I hope you do, when I consult my family doctor, when I am carried into the operating-theatre, and when I discuss a patient's problem in the department of experimental pathology. It would be a bad day for medicine and mankind if we conducted our medical training with any other objective than this. There is much talk of the dangers of increasing specialism and of our failure to regard the whole man, but these admitted hazards will be largely reduced so long as all these specialists begin their professional life as good doctors, men nicely compounded of science and humanism.

I have no intention of discussing medical education in detail but I have three comments to make:

The first is that we need not change our system because the General Medical Council has given us permission to do as we please. At breakfast the other day I sat next to a professor of physiology from South Africa, and he astounded me by the information that their students were now to have an additional year's instruction in anatomy and that he approved the change. Like all physicians and general practitioners, and many surgeons, I believe that in some medical schools too much time is already given to anatomy in undergraduate education. The South Africa intention compels the conclusion that too often we discuss medical education in subjective, unscientific terms, sometimes dominated by the powerful expression of vested interests.

This leads to the second comment, that we require more controlled experiments as to the results of our present educational methods; and a comparison of the results of different methods already in being, to decide the question, for example, of whether or not it is valuable to give our students some basic pathology before putting them to their clinical studies.

The third is that we should get ourselves taught to teach. We have university departments of education and we might ask them to give us some instruction in practical pedagogy. I suspect that this has not been done before because we are nervous lest we should be concussed by discussions of learning theory.

The question of specialism is engaging the attention of those of us who practise pædiatrics. I have no doubt in my mind what is the pattern of the future. The pædiatrician in a small centre is a general physician applying himself to an age-group whose problems are different from those of the adult. He must maintain the closest contacts with general medicine. With the better education of the medical student in pædiatrics he will increasingly find himself surrounded by family doctors who are well equipped to handle the common disorders of children—medical, psychological, and environmental. He should see that these family doctors maintain their competence in pædiatrics, and he should encourage them to do the work which he, alone maybe in his area, was fitted to do ten and twenty years ago.

‡ Published in full as a supplement to *Central African Journal of Medicine*, June, 1958; summarised in *The Lancet*, 1958, i, 270; 1958, ii, 218.

The teaching-hospital pædiatrician should have quite a different orientation. He must maintain his interest in general pædiatrics because he has the job of teaching medical students, but he should at the same time become expert in a special branch of medicine—metabolism, genetics, cardiology, neurology, hæmatology, endocrinology, or psychiatry. He must be recognised as a specialist in his field, not only by his colleagues inside the hospital, but also by kindred specialists in adult medicine. We know that children in the first year of life are better cared for in our hospital than anywhere else, but this will not be a sufficient justification in the next generation for the maintenance of a large general hospital for children. When I left adult medicine to become a pædiatrician, some of my physician friends told me smilingly that pædiatrics was a dying branch of medicine. This could only be true if the pædiatricians themselves fail to appreciate their opportunities. I need not remind you of the increasing recognition that many adult disorders strike their roots in childhood. If we fail to explore this unmapped territory ourselves many specialists in other disciplines will be eager to do so.

Pædiatrics is but a domestic affair, by comparison with some of the large issues which I have been discussing. Yet its problems illustrate well enough the progressive adaptations which are required of medicine. We have not been endowed with the gift of prophecy, and yet we must contrive to forecast the future. We must extrapolate our course with as much accuracy as we can command. We must use every device, too, to reduce the rigidity of the framework in which medicine finds itself today. Thus something to mitigate the appearance of inflexibility of the National Health Service was done when one man was whistled out of the tram in which he was happily riding "in predestined grooves" and was put in charge of a small bus in this great university.

## FURTHER REMARKS ON THE FUNCTIONS OF THE BASAL GANGLIA*

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ON a previous occasion I discussed two individual symptoms—hemiballismus and muscular rigidity—which, judged by their anatomical associations, were evidently disorders of function of the basal ganglia, and I made some deductions about the organisation and physiology of the basal ganglia (Martin 1959). Now I wish to discuss another symptom—intention tremor. This may or may not be a disorder of the basal ganglia, but in any case it throws a light on the other symptoms, and so, indirectly, has implications regarding basal gangliar function.

### Postural Fixation

I shall have to refer more than once to the function of postural fixation.

If I hold my arm horizontally in front of me, it has to be fixed in that position by the action of muscles around the shoulder, and it has to be held extended by muscles in the arm itself. The muscles of the back and of the neck help to maintain the posture, and in fact all the muscles of the trunk and legs share in the activity. The centre of gravity of the trunk moves backwards to compensate for the weight of the arm in front,

* Part of a lecture with films given at the National Hospital, Queen Square, during the centenary celebrations (June, 1960).

and the muscles of the other arm may also make compensatory adjustments. Though I use the words "fix" and "fixation" I do not mean to limit their application to conditions of immobility. When the hand is moved about, the arm is still sustained at the shoulder and other joints; the supporting muscles at the shoulder and in the arm adapt themselves to the movement, and muscles all over the body make appropriate modifications of their postural activity. In the process the centre of gravity is continuously adjusted. All this is done unconsciously, and apparently by mechanical processes.

If a patient has a lesion of one cerebellar hemisphere the muscles in the same half of his body become hypotonic, and he then fails to fix his outstretched arm firmly. It can too easily be displaced from the maintained position, and it rebounds unduly when displaced. But, what is more important, it is imperfectly supported for movement—with the result that the hand sways in the course of the movement, and at the end of a movement the exactness of its control is lost. The adjustments of the musculature of the trunk and of the legs are similarly disordered. This hypotonia and ataxia constitute a negative, or defect, symptom—a disorder due to something lacking in the movement. One mechanism of postural fixation depends, then, on the cerebellum.

Of more fundamental importance is the mechanism which supports our bodies against the action of gravity. The principal nuclei of this system are in the brain-stem (see summary in Magoun 1958), and they are associated with complex apparatus in the spinal cord and muscles. The postural reflexes also, in wide variety, bring about automatic adjustments of these mechanisms.

Recently I have had reason to believe that there is another mechanism of postural function, and I wish to consider in this connection intention tremor, hemiballismus, and muscular rigidity and the effects on them of stereotaxic operations.

## Intention Tremor

Under this heading I do not include all tremors that happen during movement, but only the characteristic intention tremor, seen in disseminated sclerosis and in few other conditions.

This tremor is a side-to-side movement which appears when the patient begins to make a "directed" movement. He fails to fix his limb normally at the proximal joints, and the more he tries the worse the shaking becomes. It increases in amplitude as the movement nears its object, and the more precise the intended movement the worse the tremor; it increases if the patient tries to touch a target. Nevertheless, the patient may make an aimless movement without tremor, or if he allows his relaxed limb to be moved passively no tremor occurs.

In man intention tremor ordinarily arises in cases with multiple lesions, and so the lesion responsible cannot be identified. In the monkey intention tremor—called by Carpenter "ataxic tremor"—is particularly associated with experimental lesions of the dentate nucleus (Carpenter 1958), and it is accompanied, especially in the early postoperative stages, by ataxia and simple tremor.

It has now been shown that intention tremor, like hemiballismus and muscular rigidity, can be abolished by a surgical lesion in the ventrolateral nucleus of the thalamus (Irving Cooper 1960, Dimsdale and Bennett 1960, McCaul and Martin 1960). As far as I know no surgeon has attempted to abolish it by a pallidal lesion, and so it is not known whether such an operation would be effective.

In the monkey, Carpenter has shown that lesions destroying the dorsal division of the ansa lenticularis (i.e., fasciculus lenticularis) abolish both simple and ataxic tremors contralaterally. Lesions of the globus pallidus reduce both ataxic and simple tremors: "they seem to be more effective in ameliorating ataxic tremor than simple tremor, while ataxia and synergic disturbances are not greatly modified" (Carpenter 1958). Thus it seems probable that the thalamic operation abolishes intention tremor by producing a pallidofugal block, although *clinical* evidence of direct association with the pallidum is still lacking.

As with hemiballismus and rigidity, when intention tremor is abolished by operation, voluntary movement in the previously affected limb seems normal (in the absence of other causes of disability). There is, therefore, no disorganisation of voluntary movement while intention tremor is present, but the tremor is superimposed on voluntary movement. In these features intention tremor closely resembles hemiballismus (Martin 1959). Further, when intention tremor, which is a disorder of fixation of a limb for movement, is abolished by operation, a normal or at least adequate power of fixation remains. There were, therefore, at least two fixation mechanisms—a disordered one which has been put out of action by the operation, and one or more normal ones which remain and provide fixation which is adequate for all ordinary purposes.

Again, because the disordered mechanism is characterised by intention tremor, we can before operation see when it is in action. The tremor appears as soon as a directed voluntary movement is initiated, and the more precise the movement the greater the tremor—indicating that the disordered mechanism is more active. This would be expected of any adjustable fixation mechanism, since the more precise the movement intended, the firmer and more exact is the fixation required, and therefore the greater the activity of the fixing mechanism. I will not carry the argument further with regard to intention tremor. Suffice it to say that the disordered mechanism comes into action with a directed voluntary movement, and especially for its most precise part.

## Hemiballismus

If we now consider hemiballismus in the same way, it becomes clear that it too is a disorder of fixation. It is a "positive" or release phenomenon, in which the muscular mechanism responsible for fixation of the limbs and trunk is acting wildly.† Its relation to fixation is perhaps more easily seen when it is reduced by sedation to a state in which it is abolished while the patient is at rest but appears again as soon as the patient begins to make a voluntary movement; it is then apparent that the limb, far from being supported normally at the proximal joint for the movement, is moved about involuntarily at its base.

The anatomical associations of hemiballismus are more clearly defined than those of intention tremor. We know the site of a lesion that will bring it on, and we know the site of a lesion that will abolish it—both in the basal ganglia. Judged by its anatomical associations, hemiballismus is a disorder of function of the basal ganglia; regarded clinically it is a disorder of fixation. Hence the basal ganglia must be concerned with postural fixation.

Further, a lesion in the pallidum or the operation of pallidofugal block abolishes the involuntary movements, and the patient can then move the previously affected limbs normally. As before, there must have been at least

† I have always accepted that hemichorea or hemiballismus was a release phenomenon, but I have never until now been able to discover what function or what mechanism was released. The fact that it is due to release of a fixation mechanism explains why hemiballismus, regarded as a chorea, has its peculiar incidence on the proximal muscles.

two fixation mechanisms, one of which was disordered, and in this case the disordered mechanism may be interrupted by an operation on the globus pallidus. There is therefore a fixation mechanism which is dependent on the globus pallidus. This is the same conclusion as before, but in its converse form. Moreover, the patient is left with adequate power of fixation in the previously affected limbs: there is no sign that the operation has interfered with the cerebellar or anti-gravity mechanisms. Thus the fixation mechanism dependent on the basal ganglia appears to be distinct from the cerebellar and anti-gravity mechanisms.

### Muscular Rigidity

Not much imagination is needed to see that muscular rigidity, too, is a disorder of fixation. The patient is suffering from too much fixation—overaction of the fixation mechanism—with consequent widespread tonic overactivity of his muscles, and, often, disturbance of the control of his centre of gravity.

I have argued previously (Martin 1959) that hemiballismus and muscular rigidity are different disorders of the same (basal gangliar) mechanism—the one depending on discontinuous innervation of the musculature and the other on a uniform continuous innervation. In hemiballismus the corpus Luysii is damaged, in muscular rigidity it is intact. In both the muscular overactivity may be abolished or reduced by pallidal lesions or by pallidofugal block.

A surgical lesion in the globus pallidus relieves muscular rigidity but does not produce hypotonia, and it leaves normal or at least adequate power of fixation. Hence it evidently interferes with a mechanism that is responsible for the excess tone—an additional tone-producing or fixation mechanism (Martin 1959).

Once we accept that muscular rigidity is a disorder of postural fixation, all the previous arguments apply. On the one hand it is a disorder of function of the basal ganglia, and on the other it is a disorder of fixation; hence the basal ganglia are concerned with fixation. Conversely, a mechanism of fixation and tone is interrupted by a pallidal lesion; hence such a mechanism is dependent on the globus pallidus. But in this case we must say " dependent on the basal ganglia ", because the corpus Luysii must be relatively intact as well.

### Negative Symptoms

These various disorders that I have considered are " positive symptoms "—i.e., they consist of something added to the normal—and, of course, nearly all the symptoms that we associate with disease of the basal ganglia are of this character. The study of these positive symptoms leads us to believe that the basal ganglia are concerned with postural fixation, and that they provide one of the fixation or supporting mechanisms of the body.

But negative effects also are known, both experimental and clinical, although I have no personal observations of this kind to offer. As far as I know they all depend on bilateral destructive lesions of the globus pallidus.

Carpenter et al. (1950) did not observe any defect of function in animals resulting from unilateral pallidal lesions (apart from an inconstant " feeding preference " for the unaffected hand); but very severe symptoms appeared when the second side was operated on, the animals being unable to stand. In later experiments Mettler (1957) observed that the animals retained any posture that was imposed upon them. Denny-Brown (1960) has described very similar effects; some of his animals eventually learned to stand when placed on their feet but their heads would gradually sink and at times would rest on the floor. Denny-Brown has also described extreme postural disturbances—astasia-abasia and immobility—in man, associated with severe bilateral pallidal lesions following coal-gas poisoning, a condition which has a selective (though not exclusive) incidence on the globus pallidus.

The effects of unilateral operations might lead us to regard the mechanism that has been interrupted as merely a supplementary one. But these reported effects of bilateral destruction of the globus pallidus show that the postural mechanism contained in the basal ganglia as a whole is of fundamental importance.

Some degree of bilateral damage, however, may be tolerated, and perhaps better by man than by the monkey. Yakovlev's (1944) patient, who had large bilateral pallidal lesions following coal-gas poisoning, seems to have gone for many years without any very disabling postural or motor disturbances, other than some disorder of gait, and recently a number of patients have had bilateral operations—either pallidectomy or pallidofugal block—without lasting disability. Thus the approximate amount of globus pallidus which must be intact and functioning to preserve anything like normal postural activity, and the extent to which other fixation mechanisms may compensate for deficiency of function of the basal ganglia, are still undetermined.

### Bilateral Action of the Globus Pallidus

I have more than once mentioned that after a unilateral operation for intention tremor, hemiballismus, or muscular rigidity, voluntary movement in the previously affected limbs seemed normal, and this accords with experimental observations. Since the effects of severe bilateral pallidal lesions in the monkey are out of all proportion to those of unilateral lesions, it is evident that after the unilateral operation the animal depends largely on the remaining (intact) globus pallidus; and so the action of that (and therefore of each) pallidum must be, to a significant degree, bilateral.

In so far as the action of the globus pallidus (and therefore of the basal gangliar mechanism) is abrogated by operation, it can evidently be done without on one side. The patient then has at his disposal for support of the previously affected limbs—first, any residual activity of the pallidum of the operated side; second, the ipsilateral action of the non-operated globus pallidus; and, third, the other fixation mechanisms: and experience shows that these provide fixation that is adequate for all ordinary purposes.

### Conclusions

Intention tremor, hemiballismus, and muscular rigidity are disorders of postural fixation.

Hemiballismus and muscular rigidity, judged by their anatomical associations, are disorders of function of the basal ganglia, and so the basal ganglia are concerned with postural activity.

While these and other disorders of basal gangliar function commonly met in clinical neurology are " positive " symptoms (i.e., due to excess activity), negative effects also are known, both in experimental work and clinically, and these severely impair postural functions.

The evidence from both positive and negative disorders, therefore, indicates that the basal ganglia provide one of the postural supporting or fixation mechanisms of the body.

The action of each globus pallidus is, to a significant degree, bilateral.

The interactions of the basal gangliar mechanism with other postural mechanisms, and subjects such as the possible diversity of its relation to voluntary movement,

and its relations to emotion and emotional movement provide obvious material for further study.

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# SUBDURAL HÆMATOMA

## A REVIEW OF 389 CASES

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THE general rise in the age of the population, and the steady increase in all varieties of trauma, make the problems of subdural hæmatomas progressively more important. Hence it seemed valuable to review the clinical presentation, the surgical management, and in particular the prognostic features, of these lesions. Accordingly, we have reviewed 389 cases of proven subdural hæmatoma admitted under the care of one of us (W. McK.) to Leavesden Emergency Hospital, Atkinson Morley's Hospital, or the National Hospital, Queen Square, between 1940 and 1958. Cases in which the subdural lesion was insignificant or had resulted from rupture of a vascular anomaly were excluded.

Classification of subdural hæmatomas into acute and chronic groups is time-honoured, but the definitions vary considerably. Munro (1942) uses the term acute in cases with "evidence of fresh or unhealed brain injury", whereas Logue (1951), Dressler and Albrecht (1957), and others classify them on a purely temporal basis. All systems of classification are imperfect, but we found that the rate of evolution of symptoms most accurately reflected prognosis. We therefore decided to term "acute" those cases presenting urgent symptoms within three days of trauma, "subacute" those presenting within four to twenty days, and chronic those presenting after twenty days. Cases with no history of trauma were classified according to total duration of symptoms.

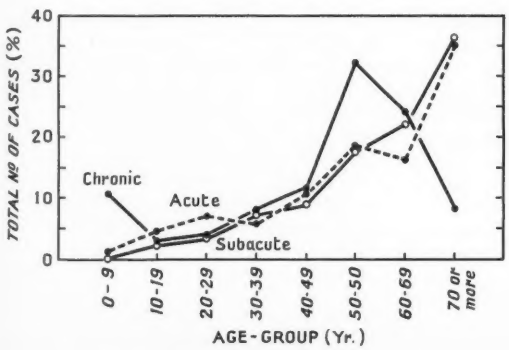


**Fig. 1—Age-distribution of the subgroups.**

## Clinical Features

### *Age-incidence and Mortality*

Because the numbers of the three types of hæmatoma were different, the figure for each ten-year period represents the percentage incidence of the total for the particular type of lesion: thus the figure 30 for chronic subdural hæmatoma in the sixth decade represents 30% of all the chronic cases in the series (70 of 213 cases).

Fig. 1 shows that the age-incidence in the acute and subacute lesions increases steadily, becoming maximal at and after seventy years. In the chronic hæmatomas, apart from those in infants; the incidence reaches an earlier peak. But the subsequent decline might be partly due to failure to diagnose the lesion, particularly in cases without a history of trauma in whom the alternative diagnosis of cerebrovascular disease may have seemed an adequate explanation for the symptoms.

The relation of mortality to age in each subgroup is shown in table I.

TABLE I—AGE-INCIDENCE AND MORTALITY IN 389 CASES OF SUBDURAL HÆMATOMA

| Age-group | 0–9 | 10–19 | 20–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70+ | Totals |
|---|---|---|---|---|---|---|---|---|---|
| Acute .. | 1 (*0*) | 4 (*0*) | 6 (*2*) | 5 (*1*) | 9 (*5*) | 15 (*10*) | 13 (*5*) | 29 (*21*) | 82 (*44*) |
| Subacute | 0 (*0*) | 3 (*1*) | 4 (*0*) | 7 (*0*) | 8 (*0*) | 16 (*4*) | 20 (*4*) | 33 (*9*) | 91 (*18*) |
| Chronic .. | 22 (*2*) | 6 (*0*) | 9 (*0*) | 17 (*0*) | 25 (*0*) | 69 (*3*) | 51 (*5*) | 17 (*3*) | 216 (*13*) |
| Totals .. | 23 (*2*) | 13 (*1*) | 19 (*2*) | 29 (*1*) | 42 (*5*) | 100 (*17*) | 84 (*14*) | 79 (*33*) | 389 (*75*) |

(Deaths indicated in parentheses)

Clearly advancing age is associated with an increasing mortality-rate in all groups, and is therefore a very important prognostic factor. The striking advantage of youth is shown by the mortality-rate of 8% among the 84 patients under forty, whereas it was 23% in the 305 patients over forty.

Subdural hæmatomas were frequent among older patients. The incidence of hypertension is of interest because these patients are prone to injury. It might also have prognostic significance. The findings were:

| | *Hypertensive* | *Normotensive* | *Unknown* |
|---|---|---|---|
| Acute .. .. .. | 24 (*13*) | 50 (*26*) | 8 (*5*) |
| Subacute .. .. .. | 30 (*5*) | 58 (*12*) | 3 (*1*) |
| Chronic .. .. .. | 45 (*5*) | 156 (*6*) | 10 (*2*) |

(Deaths in parentheses)

Thus the number of patients with hypertension was not unduly high. A raised blood-pressure seemed to have an adverse effect only in the chronic group, and it did not alter the outcome in the others.

### *Sex-incidence*

The sex-distribution was:

| | *Male* | *Female* |
|---|---|---|
| Acute .. .. .. .. .. .. .. | 54 | 32 |
| Subacute .. .. .. .. .. .. | 49 | 42 |
| Chronic .. .. .. .. .. .. | 162 | 54 |

The proportion of males was much greater in the chronic group, suggesting that additional factors operate in the production of chronic lesions as opposed to the more acute ones.

### *Ætiology*

"Major trauma" indicates an injury of sufficient severity to cause loss of consciousness, whilst "minor trauma" includes all lesser degrees of injury:

| | *Major trauma* | *Minor trauma* | *Cough* | *None* |
|---|---|---|---|---|
| Acute .. .. | 52 (*32*) | 30 (*12*) | 0 | 0 |
| Subacute .. .. | 42 (*7*) | 40 (*8*) | 0 | 9 (*3*) |
| Chronic .. .. | 51 (*1*) | 73 (*8*) | 4 (*0*) | 86 (*4*) |
| Total .. .. | 145 (*40*) | 143 (*28*) | 4 (*0*) | 95 (*7*) |

(Deaths in parentheses)

In the 4 patients in whom "cough" was regarded as a causal factor the symptoms started during a paroxysm of coughing. The possibility naturally arises that some cases

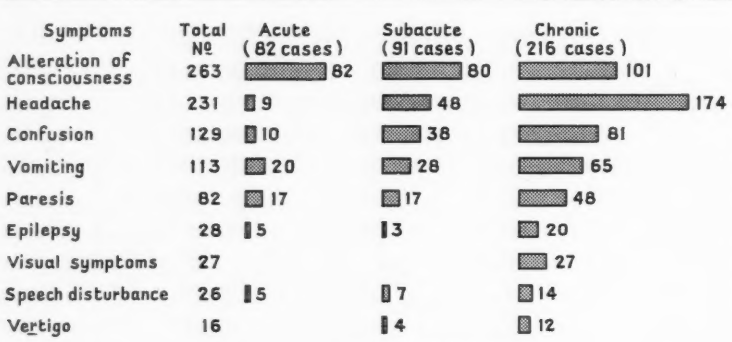
Symptoms
Total Nº
Acute (82 cases)
Subacute (91 cases)
Chronic (216 cases)
Alteration of consciousness 263 82 80 101
Headache 231 9 48 174
Confusion 129 10 38 81
Vomiting 113 20 28 65
Paresis 82 17 17 48
Epilepsy 28 5 3 20
Visual symptoms 27 27
Speech disturbance 26 5 7 14
Vertigo 16 4 12

**Fig. 2—Frequency of symptoms in the subgroups.**

of "cough headache" may be due to subdural hæmatomas. The table shows that the mortality associated with major trauma is higher in acute cases than in subacute or chronic ones. The patients with minor trauma show clearly that the rate of evolution of the neurological picture is of more constant prognostic significance.

*Symptoms and Signs*

The symptomatology shows certain natural trends (fig. 2). The striking feature is the non-specific nature of the symptoms. Alteration in the level of consciousness was prominent in the first two groups and headache was frequent in the chronic group, though of course changes in consciousness may preclude a history of headache. 19 patients gave a clear history of unilateral headache, and in all of them the lesion was on the same side as the pain. Epilepsy had pre-existed in 14 cases, and in the other 14 it was attributable to the subdural lesion. Symptomatic epilepsy was therefore uncommon.

Similarly the neurological signs on admission were of limited value in diagnosis (fig. 3).

When the clinical state at the time of admission to the neurosurgical department is compared with that causing admission to the referring hospital, it is evident that alteration in the level of consciousness was the commonest cause for transferring the patient. In a significant number of chronic cases the level of consciousness deteriorated between the times of admission and transfer to a neurosurgical bed. A similar comparison shows an increase in paresis in all groups. In the acute cases this is perhaps inevitable, but in the subacute and chronic groups it suggests unnecessary delay.

In cases with pupillary inequality the dilated pupil was on the side of the lesion in 79% and contralateral in 8%. In 13% the lesions were bilateral, and the larger pupil was usually on the same side as the larger hæmatoma.

Paresis was an even less reliable sign; it was contralateral to the lesion in 59%, and ipsilateral in 29%, and the lesions were bilateral in 12%.

Dysphasia, on the other hand, was always associated with a lesion of the dominant hemisphere. Though homonymous visual-field defects were uncommon, they were not rare, and they had accurate lateralising value.

Papilloedema was not uncommon in the chronic lesions, even when the pressure at lumbar puncture was normal or low. This was also noted by Dressler and Albrecht (1957).

Though striking fluctuations in consciousness were not commonly recorded, this sign is a useful diagnostic pointer. Fig. 3 does not include bradycardia, which was variable, nor the difference in percussion note over the vault, which was inconsistent, although stony dullness on percussion was often quite an accurate lateralising sign.

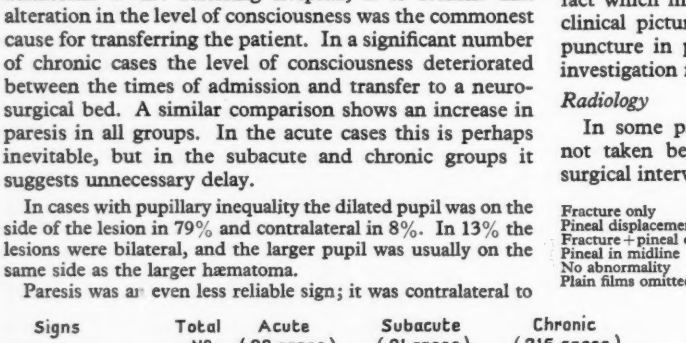
Signs
Total Nº
Acute (82 cases)
Subacute (91 cases)
Chronic (216 cases)
Alteration of consciousness 289 82 80 127
Motor signs 159 36 34 89
Pupillary inequality 116 47 25 44
Confusion/ Memory loss 92 14 19 59
Papilloedema 63 1 14 48
Dysphasia 39 5 11 23
Hemianopia 11 4 7
Facial weakness 10 3 7

**Fig. 3—Frequency of neurological signs in the subgroups.**

## Investigations

*Lumbar Puncture*

Lumbar puncture was performed preoperatively in only 120 cases. The findings are set out in table II.

The protein value, in only 42 cases, was below 50 mg. per 100 ml. in 27 cases and higher than this in 15, once being 130 mg. Many conclusions cannot be drawn from so few lumbar punctures, but we can say that chronic lesions may be associated with normal or low pressure—a fact which may be important when considered with the clinical picture. In view of the risks attending lumbar puncture in patients with space-occupying lesions, this investigation may often be omitted.

TABLE II—FINDINGS AT LUMBAR PUNCTURE IN 120 CASES OF SUBDURAL HÆMATOMA

| Subgroup | Acute | Subacute | Chronic | Total |
|---|---|---|---|---|
| No. of lumbar punctures | 6 | 28 | 86 | 120 |
| Pressure: over 200 mm. | 5 | 14 | 25 | 44 |
| 100–200 mm. | 1 | .. | 38 | 39 |
| below 100 mm. | .. | .. | 23 | 23 |
| not recorded | .. | 14 | .. | 14 |
| C.S.F.: xanthochromic | 1 | 10 | 22 | 33 |
| clear | .. | 6 | 64 | 70 |
| bloodstained | 5 | 12 | 0 | 17 |

*Radiology*

In some patients plain radiographs of the skull were not taken because the clinical state demanded urgent surgical intervention. The findings were:

| | *Acute* | *Subacute* | *Chronic* | *Total* |
|---|---|---|---|---|
| Fracture only | 28 (*14*) | 17 (*3*) | 12 (*1*) | 57 (*18*) |
| Pineal displacement only | 4 (*2*) | 21 (*3*) | 45 (*2*) | 70 (*7*) |
| Fracture + pineal displacement | 6 (*4*) | 2 (*0*) | .. | 8 (*4*) |
| Pineal in midline | 3 (*1*) | 2 (*0*) | 7 (*0*) | 12 (*1*) |
| No abnormality | 24 (*10*) | 43 (*8*) | 117 (*8*) | 184 (*26*) |
| Plain films omitted | 20 (*14*) | 10 (*4*) | 20 (*2*) | 50 (*20*) |

(Deaths in parentheses)

As would be expected, the incidence of fracture is higher in the acute group, indicating that more severe trauma is associated with earlier appearance of symptoms.

Pineal displacement was usually associated with volumes of over 50 ml. in the subdural space, but midline pineal glands were found in some unilateral cases with volumes of over 100 ml., and once with 200 ml. Thus, though the number of cases is small, pineal displacement does not seem to be a significant prognostic factor, despite its diagnostic value.

Angiography was performed in only 21 patients, in all of whom the correct diagnosis was made; only one died afterwards, but from unrelated causes. The value of angiography as a safe, diagnostic method obviously cannot be assessed on so few cases, particularly as it was used only in patients in a reasonable clinical state, in whom an alternative diagnosis of vascular occlusion was possible. Increasing experience with angiography in acute head injuries may in time point to whether one should use this technique rather than diagnostic burr-holes occasionally aided by ventriculography.

The incidence of bilateral lesions in our series was:

| | *Unilateral* | *Bilateral* |
|---|---|---|
| Acute | 55 (*67%*) | 27 (*33%*) |
| Subacute | 73 (*79%*) | 18 (*20%*) |
| Chronic | 178 (*84%*) | 34 (*16%*) |

The steady decrease in the frequency of bilateral lesions with increasing chronicity probably supports the suggestion that many small hæmatomas can be absorbed spontaneously (Browder 1943). Surgically it reaffirms the need for bilateral exploration.

## Treatment and Results

Whilst the problems of surgical investigation and treatment are somewhat different in the three groups, we think that, retrospectively, they can be considered together. The details are shown in table III.

TABLE III—SURGICAL MANAGEMENT OF THE 389 CASES OF SUBDURAL HÆMATOMA

| Subgroup | Acute | Subacute | Chronic | Total |
|---|---|---|---|---|
| Burr-hole exploration | 77 | 91 | 200 | 368 |
| Lesion found by burr-holes | 66 | 89 | 184 | 339 |
| Ventriculography required | 11 | 2 | 16 | 29 |
| Burr-holes and immediate craniotomy | 10 (*5*) | 3 (*1*) | .. | 13 (*6*) |
| Burr-holes and delayed craniotomy | 5 (*3*) | 9 (*2*) | 16 (*1*) | 30 (*6*) |
| Burr-hole evacuation alone | 62 (*31*) | 79 (*15*) | 184 (*11*) | 325 (*57*) |
| Primary craniotomy | .. | .. | 12 (*1*) | 12 (*1*) |
| Died before surgery | 5 | .. | .. | 5 |
| No operation required | .. | .. | 4 (calcified) | 4 |

(Deaths in parentheses)

### *Acute and Subacute Cases*

Our routine procedure is to make a burr-hole in relation to a fracture if present, but otherwise to make burr-holes bilaterally in the postparietal region. If a liquid lesion is revealed it is evacuated, but if the lesion is solid, a craniotomy is likely to be necessary. When burr-hole exploration does not reveal a significant lesion, the lesion is located by air studies.

Our experience points to the source of bleeding being from the veins in relation to the sphenoid ridge or petrosal sinus in many cases, as suggested by Chambers (1951). But we were unable to correlate the site of the lesion with the direction of injury as did Bisgaard-Frantzen and Dalby (1957), admitting that in a retrospective study the relevant information is sometimes lacking.

Though our figures do not support the view that immediate craniotomy is the treatment of choice in acute lesions, in our series craniotomy was adopted only in the more seriously affected patients. Moreover, in some of the fatal cases which underwent burr-hole aspiration alone the lesion was inadequately treated by this technique. In others, accessible associated traumatic intracerebral hæmatomas were discovered post mortem. Our experience does suggest, however, that procedures such as subtemporal decompression are of no value and, by increasing venous congestion, may indeed be harmful (Aronson and Kaplan 1957).

### *Chronic Cases*

21 of the chronic cases were diagnosed by angiography, and these were all later treated by burr-hole aspiration. In the majority of chronic cases the lesion was suspected on clinical grounds and revealed by diagnostic burr-holes. In many of these patients an expanding intracranial process was diagnosed, and the true nature of the lesion was revealed by burr-holes made before ventriculography. But in some of them the lesion was revealed only by air studies, as, for example, in the 12 with ventriculographic findings suggestive of tumour in whom primary craniotomy was performed. Craniotomy was performed after burr-hole drainage in the others if their condition deteriorated or if the lesion failed to resolve after repeated tapping of the subdural space.

### *Associated Lesions*

When considering surgical management one must not forget the possibility of associated lesions, for a significant subdural hæmatoma does not exclude or necessarily diminish the role they may play in the final outcome. In our series they were:

| | *Acute* | *Subacute* | *Chronic* |
|---|---|---|---|
| Extradural hæmorrhage (unrecognised) | 1 (*1*) | .. | .. |
| Intracerebral hæmatoma | 11 (*10*) | 3 (*1*) | .. |
| Posterior-fossa hæmatoma | 2 (*1*) | .. | .. |

The patient with an extradural hæmorrhage had a large subdural lesion, the extradural hæmatoma being contralateral to it. The intracerebral hæmatomas were mainly found in the temporal region, and all these patients deteriorated after burr-hole evacuation of their subdural lesions. In the acute group an intracerebral hæmatoma was in fact the commonest cause of immediate deterioration after evacuation of the subdural hæmatoma; only 1 patient in this group survived, and he had a stormy course. When this patient died seven years later from lung cancer, necropsy revealed evidence of an old temporal-lobe hæmatoma. 1 patient with a posterior-fossa lesion died soon after evacuation of the supratentorial hæmatoma, whilst in the 2nd the diagnosis was made later at ventriculography.

### *Complications*

The commonest " complication " of surgery was failure to improve after treatment, and these cases showed post-mortem evidence of gross cerebral œdema, brain-stem distortion, or frank hæmorrhage. But we must consider further those cases which initially improved after surgery and later regressed, or in which surgery seemed to be deleterious. These are shown in table IV.

Epilepsy in the immediate postoperative period was usually in patients who had presented with this symptom, and, despite energetic measures for its control, a proportion of them developed intractable status epilepticus and died.

Pneumonia was not purely a terminal illness, but in the elderly it was associated with general drowsiness. The cases in which it supervened in the course of prolonged coma have not been included. In recent cases respiratory complications have been more successfully managed by early tracheostomy, thus allowing of adequate bronchial toilet.

As previously mentioned, deterioration in the acute and subacute group after burr-hole evacuation was most commonly associated with intracerebral hæmatomas. In some, however, it was due to inadequate removal of the lesion, and

TABLE IV—MODES OF DETERIORATION AFTER SURGERY

| — | Acute | Subacute | Chronic | Total |
|---|---|---|---|---|
| Epilepsy | 6 (*4*) | 4 (*4*) | 8 (*0*) | 18 (*8*) |
| Pneumonia | 6 (*6*) | 4 (*4*) | 5 (*3*) | 15 (*13*) |
| Deterioration after burr-hole evacuation | 17 (*15*) | 2 (*1*) | 6 (*1*) | 25 (*17*) |
| Deterioration after craniotomy | 2 (*2*) | .. | 3 (*2*) | 5 (*4*) |
| Low-pressure syndrome | 3 (*1*) | 5 (*1*) | 7 (*2*) | 15 (*4*) |
| Further bleeding | 1 (*1*) | .. | 4 (*1*) | 5 (*2*) |

(Deaths in parentheses)

in 3 cases it seemed to be part of the natural progression of the illness. In the chronic group the patients were all elderly and with depression of consciousness. Deterioration seemed to be associated with the sudden evacuation of a large lesion; for, in the case that died, when 100 ml. of fluid had been removed, the patient suddenly became comatose, and necropsy later showed a large brain-stem hæmorrhage which presumably happened when the hæmatoma was evacuated. Of the patients who deteriorated after craniotomy, the 2 acute cases showed gross cerebral œdema, and the 3 chronic cases showed hemisphere collapse, as reported by Pecker (1957), only 1 responding to treatment.

Intracranial hypotension, as described by Knebs et al. (1937) and Morice (1944), was present in 15 cases. In all of them it was diagnosed by lumbar puncture, and all were treated by intrathecal injection of sterile normal saline and adequate general hydration. 11 of these patients responded dramatically, though several required repeated intrathecal injections. Cortisone, as suggested by Pecker (1957), was not used, neither did we adopt the technique of intravenous injection of distilled water (Holmes 1953).

*State of Consciousness*

The level of consciousness has a direct bearing on mortality in head injuries (Rowbotham et al. 1954) and in spontaneous intracerebral hæmorrhage (McKissock et al. 1959). In this series the state of consciousness on admission was studied with the following results:

| | *Acute* | *Subacute* | *Chronic* |
|---|---|---|---|
| Alert | 0 | 11 (*0*) | 89 (*2*) |
| Drowsy | 22 (*8*) | 58 (*10*) | 80 (*6*) |
| Stuporose | 35 (*18*) | 12 (*4*) | 35 (*4*) |
| Comatose | 25 (*18*) | 10 (*4*) | 4 (*1*) |

(Deaths in parentheses)

Patients were classified as alert if in spontaneous contact with their surroundings, regardless of dysphasia; drowsy if they could only be roused by stimulation; stuporose if inaccessible but able to respond in a purposeful manner to noxious stimulation; and comatose if without response to pain. It is at once obvious that in all groups an increasing mortality is related to diminishing consciousness, but that the mortality is also related to the acuteness of the lesions. Thus a patient who is drowsy with an acute lesion may have a worse prognosis than a stuporose patient with a chronic lesion.

*Size of Hæmatomas*

The volume of the lesions seemed to bear no relation to prognosis.

*Outcome of Surgical Treatment*

Table v shows the immediate surgical death-rates. The overall mortality-rate was about 20%, but this figure is of limited significance as it obviously depends on the relative proportion in each group. What is important is the good prognosis for the survivors, and this is most obvious in the subacute and chronic cases.

TABLE V—OUTCOME OF CASES TREATED SURGICALLY

| Subgroup | Acute | Subacute | Chronic |
|---|---|---|---|
| Total cases | 77 | 91 | 212 |
| Died after surgery | 39 | 23 | 13 |
| Died later from other causes | 3 | 4 | 8 |
| Lost in follow-up | 3 | 5 | 12 |
| Known survivors | 32 | 59 | 179 |
| Totally disabled | 3 | 1 | 6 |
| Partially disabled | 11 | 5 | 23 |
| Well | 18 | 53 | 150 |
| Surgical mortality-rate | 51% | 24% | 6% |

**Discussion**

Subdural hæmatoma can often be diagnosed with a fair degree of accuracy in patients with a history of recent trauma. In such patients the indications for exploratory burr-holes or other investigations are quite definite. In nearly 40% of cases, however, such a history is not forthcoming, and in these patients diagnostic errors are most likely to be made, many being elderly, with lesions of the chronic type. One must remember that headache and mental symptoms, associated with few signs in the limbs, are prominent features in such patients, and may be attributed to atherosclerotic degeneration or cerebral thrombosis. Particularly when dealing with elderly patients, the possibility of a subdural hæmatoma should not be overlooked, and the appropriate investigations must be made. An untreatable lesion should never be diagnosed on clinical grounds alone. Simple investigations, such as skull radiography, may be helpful in revealing a fracture, a displaced pineal gland, or signs of raised intracranial pressure. Almost half our series showed such abnormalities. At the same time completely normal findings—and even a midline pineal gland—do not exclude a subdural lesion. Even the time-honoured investigation of lumbar puncture is usually unhelpful.

The more elective investigations have to be considered against the background of presentation. One cannot debate their relative merits in subdural hæmatoma, as the diagnosis is so often established when burr-holes are made for ventriculography. In acute cases and others associated with known trauma the diagnosis of intracranial hæmatoma is often made. In such cases the diagnosis is best confirmed or excluded by exploratory burr-holes, provided that if a significant lesion is not discovered ventriculography should be undertaken. We have no firm views on the merits of angiography or ventriculography, and the decision must obviously depend on individual experience and the case concerned. But if a subdural lesion is suspected in an elderly patient exploratory burr-holes are undoubtedly the investigation of choice, for this usually produces diagnosis and cure simultaneously.

This study of subdural hæmatomas has demonstrated some of the diagnostic difficulties as well as some pointers to diagnosis. Further views on prognosis have also emerged. One of the most important is the significance of the level of consciousness at the time of treatment. This emphasises the need for early diagnosis or suspicion of the lesion, before the patient's conscious state has regressed irreversibly. Of equal importance is the chronicity of the lesion, in that the more rapidly the symptoms evolve the worse the prognosis, as shown by the different mortalities in the three groups (table I).

Associated injuries are always likely. Many intracerebral hæmatomas were found in the acute group, and particularly in patients whose condition deteriorated after evacuation of the subdural collection, in whom a second space-occupying lesion was often found.

Age clearly influences mortality. Over seventy the older the patient the worse the prognosis, presumably because the ageing cerebrovascular state does not allow of such gross disturbances.

The prognosis therefore rests mainly on the changes in the brain as a consequence of the hæmatoma, this being reflected in the state of consciousness and in the rate of evolution of the clinical picture; but the outcome is naturally worse if there is associated brain damage, and it is aggravated by increasing age.

**Summary**

389 cases of proven subdural hæmatoma are presented. They were subdivided into acute, subacute, and chronic varieties.

The most important prognostic factors were the patient's state of consciousness at the time of treatment, and the rate of evolution of the clinical picture. Age also influenced prognosis, but factors such as the size of the lesion, the nature of the trauma, and hypertension, had limited significance.

In acute and subacute cases burr-hole explorations were made in the first place; in chronic cases the lesion was usually suspected clinically and later revealed by burr-holes. Craniotomy was adopted only in the more seriously affected patients.

The common complications of surgery included failure to improve because of gross cerebral œdema, brain-stem distortion, or hæmorrhage; epilepsy; pneumonia; intracerebral hæmatoma; and intracranial hypotension.

The total operative mortality-rate was about 20%, and of the 270 known survivors, 221 made good recoveries. The need for early diagnosis and treatment has been stressed.

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# MENTAL ABNORMALITIES FOLLOWING SUBDURAL HÆMATOMA *

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CHRONIC subdural hæmatoma is a common complication of less severe head injuries (Peet 1949). Trotter described the condition in 1914, but it was Putnam and Cushing (1925) who stimulated interest in it. Even so, until fairly lately subdural hæmatomas were very often discovered only at necropsy. The apparent notable increase in frequency of this condition is probably due to three main factors: (1) the increased number of head injuries; (2) the increasing life expectancy (most patients with this condition are aged 40–70 [Peet 1949] ); and (3) increased awareness of this complication.

## Diagnosis

In subdural hæmatoma a head injury sometimes almost too trivial to be remembered usually precedes the onset of headaches, which may be generalised or localised. Symptoms of raised intracranial pressure, such as visual failure and vomiting, may occur; but more commonly headache is associated with fluctuation in the level of consciousness, sometimes with incontinence of urine. Periods of apparent normality alternate with periods of drowsiness, which increase in duration as time passes. In longstanding cases impairment of mental function may proceed to dementia.

The physical signs may be few: confusion, inattention, and apathy may be the only manifestations of bilateral lesions. Focal signs may indicate a localised hæmatoma, and these differ in no respect from those of other space-occupying lesions. Lumbar puncture may reveal a normal pressure and cerebrospinal fluid, and the arteriographic and pneumoencephalographic appearances are characteristic. The electroencephalogram is sometimes of help, but the surest way of confirming the diagnosis is by making burr-holes.

## Treatment

In most cases the hæmatoma is easily evacuated by suitably placed burr-holes. The fluid hæmatoma is aspirated and the subdural space carefully irrigated with saline solution, Ringer's solution, or an 0·5% solution of 'Milton' to dislodge any residual clots. If the hæmatoma is solid with membrane formation, a formal osteoplastic flap is raised and the clot and membrane are removed.

In the present series of 44 consecutive cases of head injury admitted to the neurosurgical unit there were 11 cases of chronic subdural hæmatoma. Of these 11 patients 4 were cured and discharged from the unit to their homes, and 3 died in hospital at various times after operation; 4 were transferred with mental abnormality to a mental hospital, where 2 died after two months and the other 2 remain (see table).

All patients who died were examined post mortem, and it was confirmed that no other cerebral lesion could be held responsible for death. In each case death was ascribed to bronchopneumonia.

## Discussion

This small series is necessarily selected. The cases were, however, consecutive, all being admitted from other hospitals in the area served by the unit. They represent a very small proportion of the total number of head injuries in the area served. The high proportion of subdural hæmatomas in this series and the high mortality may be partly accounted for the large number of elderly retired people on the South Coast, and the consequent high average age of the patients.

I have found no reported record of the mortality of a comparable series; but the incidence of mental disease following cerebral trauma seems to be relatively low.

Of 70,987 cases of head injury, May (1949) found that mental disease developed in 0·3%. Bowman and Blau (1949) found 192 cases of mental disease following trauma in a series of 25,269. Frazier and Ingham (1920) found 4 cases of mental disease in a series of 200 gunshot wounds of the head. Earley (1935) found that of 100 cases of fractured skull, defective memory developed in 7, personality changes in 4, and traumatic psychosis in 3. Stone and Brams (1927) in a series of 54 severe head injuries found 3 cases of traumatic psychosis, while Glaser and Shafer (1932) found mental disease in 9% of 225 cases of head trauma.

### *Ætiological Factors*

In the present series of 11 cases of subdural hæmatoma, the 4 patients in whom mental abnormalities developed were all males. Of 192 cases mental disease described by Bowman and Blau (1949) in which mental disease developed, only 16 were females.

Arteriosclerosis and alcoholism are the two main conditions predisposing to serious sequelæ following head injuries. Most workers agree that the serious after-effects

* Based on a paper read before the Society of British Neurological Surgeons, November, 1958.

DATA ON 11 CASES OF SUBDURAL HÆMATOMA

| Case no. | Age (yr.) | Sex | Interval from injury to operation (days) | Nature of operation | Operative findings | Mental state | Result | Cause of death |
|---|---|---|---|---|---|---|---|---|
| 1 | 35 | M | 9 | Burr-holes | Bilateral clot, partly fluid, partly solid | Personality disorder; delusions | Survived in mental hospital | .. |
| 2 | 74 | M | 5 | (1) Burr-holes (2) Osteoplastic flap | Rt-sided clot, partly fluid, partly solid; cortex did not expand | Dementia; aggressive hallucinations | Died in mental hospital 2 mos. later | Collapse of lung and pneumonia |
| 3 | 52 | F | ? | Burr-holes | Rt-sided clot, fluid | Confusion | Died 3 days later | Bronchopneumonia; no abnormality found in brain |
| 4 | 62 | F | 11 | Burr-holes; 2 aspirations | Rt-sided fluid hæmatoma | Confusion, then normal | Home; cured | .. |
| 5 | 68 | M | 14 | Burr-holes; 3 aspirations | Bilateral subdural hygroma; brain did not expand fully | Confusion; dementia | Mental hospital; died 2 mos. later | Bronchopneumonia; no abnormality found in brain |
| 6 | 67 | F | 6 | Burr-holes | Lt-sided fluid hæmatoma; cortex did not expand | Normal | Home; cured | .. |
| 7 | 72 | F | ? | Burr-holes | Bilateral hygroma | Coma | Died 4 days later | Bronchopneumonia; no abnormality found in brain |
| 8 | 56 | F | 19 | Burr-holes; fluid and air into ventricles | Cortex depressed, did not expand | Dementia | Died 3 mos. later | Pneumonia |
| 9 | 57 | M | 28 | Osteoplastic flap and decompression | Partly fluid, partly solid; rt side | Normal | Home; cured | .. |
| 10 | 58 | M | 16 | Burr-holes; fluid injected into ventricles | Bilateral hygroma | Korsakow's syndrome | Mental hospital | .. |
| 11 | 72 | F | 13 | Burr-holes | Bilateral membrane present | Confusion which cleared in few weeks | Home; cured | .. |

of head injury, such as mental abnormalities, are found mostly in older patients.

*Classification of Mental Disorders following Trauma*

The following classification by Mayer-Gross et al. (1954) is simple and adequate:

Three main patterns of disturbance of mental function may follow trauma: (1) clouding of consciousness, (2) dysmnesic syndrome (a defect of retention and all aspects of memory), (3) dementia.

In the chronic stage which may follow subdural hæmatoma, the disabilities are classified as: (1) organic defects ( [a] post-traumatic dementia and personality change, [b] post-traumatic epilepsy and focal neurological syndromes); (2) functional-organic defects (postconcussional or post-contusional syndrome); (3) precipitated endogenous and organic psychosis.

In the present series of 11 cases confusion was present in 7 in the early stages postoperatively and remained permanently in 4. Personality disorder was prominent in 1 case, and dementia was found in 3; aggressive hallucinations occurred in 1 patient with dementia. In a patient aged 58 Korsakow's psychosis developed over a year after his hæmatoma had been evacuated; this patient is still under treatment in a mental hospital. 2 patients had delusions.

All the patients, except 1 who was comatose, appeared mentally normal before operation. In all cases a unilateral or bilateral subdural hæmatoma was found, and the mental abnormalities occurred after the hæmatoma had been successfully evacuated. In 3 cases the hæmatoma was partly solid and partly fluid. In 4 cases the brain on one or other side did not expand after the hæmatoma had been evacuated. This finding is of grave significance: of these 4 patients 3 died, and only 1 recovered satisfactorily. Lalonde and Gardner (1948) emphasised the seriousness of this finding, and recommended the injection of normal saline intrathecally by the lumbar route in all such cases; they claimed good results, and had also had a satisfactory outcome when the ventricles had been gently distended with saline. This procedure was tried in 2 of the present cases; in 1 it was successful, and in the other it was not. The reason why the brain does not expand is not fully understood, but vascular thrombosis superimposed on arteriosclerosis may be responsible.

*Treatment*

The earlier the subdural hæmatoma is diagnosed and treated, the more likely is the result to be successful—though in case 9 of the present series, when operation was delayed for twenty-eight days, the patient recovered well and returned home cured.

In elderly patients care of the chest is most important. A suitable antibiotic is given; and the patient is turned from side to side every two hours if unconscious, but, if the patient is sufficiently alert, breathing exercises are given at regular intervals. The skin is washed and rubbed with spirit, and powdered every four hours, and the bowels are regulated by aperients or enemas. Incontinence of urine is often present, and in order to prevent bedsores it is necessary to drain the bladder by an indwelling polyethylene tube. Tracheotomy is a life-saving procedure in patients who remain long unconscious. Later treatment consists in mental and physical rehabilitation in the surroundings of a modern mental hospital.

44 consecutive cases of head injury included 11 instances of subdural hæmatoma.

4 patients recovered; 3 died in the neurosurgical unit; and 4 were admitted to a mental hospital, where 2 of these died, and 2 have remained mentally deranged.

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# UNSUSPECTED TREATABLE ORGANIC DEMENTIA

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PROGRESSIVE mental deterioration is often accepted as a psychiatric diagnosis, and the underlying cause may remain unrecognised. The purpose of this note is to underline the need for accepting such a diagnosis with the utmost caution, and we would stress the need for early investigation of these patients. The closer association of psychiatric diagnosis and treatment with general hospitals in the future should help in detecting organic disease in patients who would otherwise be regarded as having a psychopathic dementia. It is certain that in some of these patients the root cause has gone unsuspected to the grave.

The following are illustrative cases and do not exhaust our experience. Four of the five have presented in the past year.

## Case-records

**Case 1.**—A lively healthy schoolboy of 13 was mentally normal until Christmas, 1958. Thereafter he became morally defective and inexplicably took to thieving; he had eight convictions for theft in three months. His parents could no longer control him and he was belligerent and aggressive. His stock remark to parents and magistrates was: "Drop dead." This conduct secured him admission to a remand home where he disturbed the peace by crying and singing at night. He did complain of headaches "like hammering" and for two months vomited two or three times a day. He was repeatedly examined medically but no diagnosis other than "high temperature" was made. He was admitted to hospital for a few days but his conduct there resulted in early discharge. A temporary palsy of the left leg "responded well to slapping". In June he saw a psychiatrist who reported that "his behaviour is half-way between hysteria and malingering, but a cerebral tumour must be eliminated".

The officer in charge of the remand home, undeterred by the negative medical opinion, insisted that the boy was ill, and at last he was admitted to this hospital on Aug. 19, 1959. He had lost consciousness on the morning of admission and had bilateral papillœdema and hæmorrhages in the fundi but no localising signs. Carotid arteriography revealed a large right frontal space-occupying lesion. Exploration revealed a large right frontal cerebral abscess, which was drained by aspiration. Six weeks later he was discharged symptom-free and mentally normal. In his own words: "It took them a long time to find out what was the matter with me."

**Case 2.**—An elderly man of 77 had good health and occupied himself by hard work in his garden and with odd-jobbing for his neighbours. Just before Christmas, 1958, while digging round one of his apple trees he struck his head sharply on a branch. He felt momentarily dazed but soon recovered. Next day his right foot dragged, and when on his way home from a neighbour's he fell over. From then on he deteriorated mentally, becoming drowsy, incontinent, confused, and completely unlike his former self.

It was not until Jan. 26, 1959, that he was admitted to this hospital drowsy and confused and with a right facial weakness but no other localising sign. Carotid arteriography revealed a large right parietal subdural hæmatoma. After evacuation of this he progressed well and was discharged mentally recovered three months later without any paresis.

**Case 3.**—An epileptic woman of 60 sustained a fracture of the left parietal bone in 1954 during a fit. Thereafter she became confused and ataxic with nystagmus and dysarthria. In 1958 a subdural hæmatoma was suspected but cerebral arteriography failed to confirm this. Her fits continued and her intelligence deteriorated further. Her husband, who had looked after her devotedly, tried to strangle her but desisted and gave himself up to the police. The patient was temporarily admitted to another hospital and the husband was admitted to a mental hospital. Six months later the patient collapsed in the street and was brought into this hospital on May 7, 1959, with a left facial paresis and a large right pupil but no other localising signs. She was comatose, but the coma was only temporary. Carotid arteriography revealed a large right parietal hæmatoma. This was evacuated with much difficulty; it was clearly a chronic one, for the underlying cerebral cortex was atrophic. Her mental state did not improve.

**Case 4.**—A man of 58 lived by himself in a caravan. He developed pneumonia and was admitted to hospital with a lung abscess which responded to antibiotics, and he was discharged on Aug. 21, 1959. The same evening neighbours heard him making a noise and he was later found confused and incontinent. He refused to see a doctor, but the police later brought a doctor to see him. He was readmitted five days later to the same hospital, where his condition continued to deteriorate. By Sept. 3, 1959, he was deeply unconscious and incontinent with a left hemiparesis. He was then transferred to this hospital. Carotid arteriography showed a large right parietal subdural hæmatoma. This was evacuated and his mental state was normal the following day. He was discharged twelve days later.

**Case 5.**—A nun of 41 was returning to her convent in London from a visit to her relations in Dublin. She arrived at Euston station in an extremely drowsy state, having entered the train herself at Holyhead. She was removed from the train and taken to the convent by ambulance. When seen by a doctor next morning she was fully conscious, and though voluble appeared to be otherwise normal. She remembered her arrival at Euston station but did not know how she had got to the convent. Later in the morning she lapsed into semicoma but still without any localising sign. From subsequent inquiry it appeared that she had been increasingly forgetful and unable to concentrate for at least six months. She was slow to get up in the morning, and it took an hour or two for her to "wake up". She had had occasional headaches and had vomited at times. She was admitted the same day to this hospital in semicoma; her left pupil was dilated but there were no other localising signs. Carotid arteriography revealed a deeply situated right temporal meningioma. This was removed successfully, and the patient was discharged five weeks later symptom-free.

## Comment

It is very easy to ascribe changes in the psyche to mental deterioration in the elderly, to the effects of prolonged epilepsy in those subject to that disease, to dementia præcox in the young adult, and to moral deficiency in the youngster, when in fact a very real organic intracranial cause is directly responsible. Many a treatable patient must have been buried with the wrong diagnosis on the death certificate. The examples we have instanced are not exceptional: they illustrate a cautionary tale.

We wish to acknowledge assistance given by our clinical colleagues, especially Mr. T. G. I. James, in allowing us access to their records.

"Even the governments have neglected unduly the larger considerations in their stress upon disarmament as a precondition for large-scale assistance; for unless greater stability is achieved in the areas of social ferment, the temptations and dangers of such instability will tend to undermine the conditions for disarmament. Indeed, they pose a major threat to an all-too-fragile peace."—RICHARD M. FAGLEY, *The Population Explosion and Christian Responsibility*. New York, 1960.

# A SURGICAL APPROACH TO THE MANAGEMENT OF HEART-BLOCK USING AN INDUCTIVE COUPLED ARTIFICIAL CARDIAC PACEMAKER

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COMPLETE heart-block may be symptomless, disabling because of low cardiac output, or a threat to life because of repeated Stokes-Adams seizures. Medical treatment is unsatisfactory.

When life is threatened by repeated Stokes-Adams seizures, artificial pacemaking is indicated. Success has been achieved by external pacemaking (Zoll 1952, Zoll et al. 1954, Leatham et al. 1956) and by the use of a cardiac electrode passed into the right ventricle from the arm (Furman and Robinson 1958). The first method causes painful muscle contractions with each stimulus, while the second may lead to venous thrombosis (despite anticoagulant therapy) and even to perforation of the heart. These methods are therefore temporary.

The occurrence of complete heart-block after repair of ventricular septal defect has provided a stimulus to a surgical approach. Lillehei (Weirich et al. 1957) showed that such heart-block could be treated successfully with suture electrodes in the ventricular muscle, brought out through the chest wall to a pacemaker. We have applied this technique to the treatment of recurrent Stokes-Adams seizures in non-surgical acquired heart-block. The leads through the skin make this method unsuitable for permanent use.

There are patients in complete heart-block without Stokes-Adams seizures who are disabled by low cardiac output. The fixed bradycardia of idioventricular rhythm permits an increase in cardiac output only by an increase in stroke volume of the heart, which may be limited by varying degrees of myocardial damage. An artificial increase in pulse-rate should enable such patients to increase their cardiac output. It would be desirable to treat these patients by artificial cardiac pacemaking if the disadvantages of the methods described could be overcome.

We have developed an inductive coupled cardiac pacemaker which gives painless control of the heart-rate through the intact skin. This instrument consists of a primary and secondary circuit (fig. 1). The secondary circuit consists of a nylon-embedded induction coil fixed in the left pectoral muscle over the second intercostal space at thoracotomy (fig. 2). The ends of the coil are continued as nylon-covered braided stainless steel wires, with atraumatic needles on the bare ends, which are fixed in the ventricular muscle. The needles are then removed. When the wound is closed the coil forms an easily palpable tumour which is not tender.

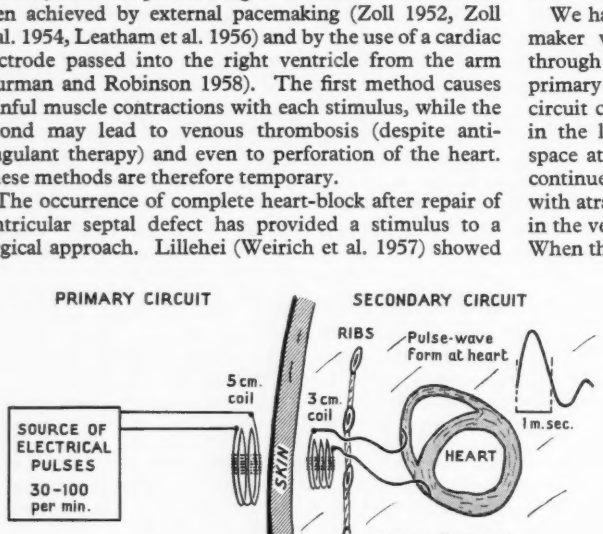


**Fig. 1—Diagram of the method of inductive coupled pacemaking.**

The primary circuit consists of an inducing coil supplied by a portable transistor pulse generator which produces short pulses at adjustable intervals and intensity (fig. 3). The primary coil is fixed to the skin over the secondary coil in which the pacemaking pulse is induced.

We report control of the heart-rate of three patients by this method.

## Case-records

### THE FIRST CASE

A woman of 56, a secretary, was well until last October, when she had two episodes of sudden loss of consciousness, each lasting about half a minute. No convulsions were observed. For the next 3 months she had momentary attacks of giddiness several times a day, especially on changing posture, and had two episodes of sudden transient loss of consciousness. She

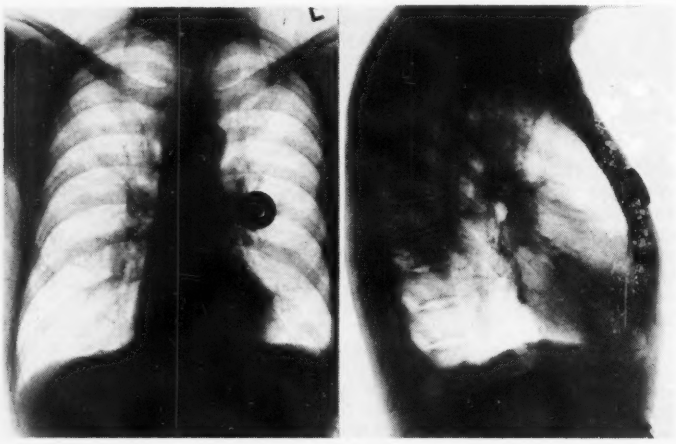

**Fig. 2—Postero-anterior and lateral chest X-rays of case 2, showing the secondary coil in place.**

**Fig. 3—The transistor pulse generator and the inducing coil.**

was admitted to another hospital on Jan. 21, 1960, after having two further episodes of loss of consciousness, at work, each lasting about 3 minutes. Complete heart-block with Stokes-Adams seizures was diagnosed. The pulse-rate was 29 and the electrocardiogram showed atrioventricular dissociation.

Treated with ephedrine and 'Hyperduric' adrenaline, she had no further seizures until February 11. During the following 36 hours she had five Stokes-Adams seizures in which cardiac asystole was observed. The two most severe caused unconsciousness for 4 minutes and she became temporarily maniacal on recovery. She was then transferred to this hospital.

On examination here she was intelligent and cooperative. She was in mild congestive cardiac failure with a left pleural effusion. The pulse was regular (rate 28) and her blood-pressure was 170/60 mm. Hg. The heart was not enlarged. The heart sounds were normal and there were no murmurs, but there were occasional ectopic beats which did not achieve ejection.

It was thought that urgent cardiac pacemaking was indicated and thoracotomy for insertion of myocardial electrodes was advised. In view of the possibility that after a period of pacemaking by Lillehei's method Stokes-Adams seizures might cease, it was decided to insert the secondary coil of the inductive coupled pacemaker at the same time.

Immediately before induction of anæsthesia she had another Stokes-Adams seizure. After $1^1/_2$ minutes' asystole a needle was inserted through the left 4th interspace into the heart and a second into the skin. These were attached to a pacemaker and pacemaking was established at a rate of 80 per minute. She recovered consciousness but became maniacal, making induction of anæsthesia difficult. After this was achieved she again became pulseless, and a rapid left anterior thoracotomy was performed which revealed cardiac tamponade. The pericardium was full of blood from the needle puncture in the right ventricle. The heart was flaccid and arrested but responded immediately to massage at an idioventricular rate of 48. A blood-transfusion was given into the right ventricle while massage was continued. The heart-beat became more vigorous and its rate was increased to 90 by application of the pacemaker. The episode of asystole and hypotension lasted about 4 minutes. Removable nylon-covered stainless-steel wire electrodes were attached to the right and left ventricles and brought out together through the chest wall below the incision. Pacemaking was continued through these. The secondary coil and its leads were then fixed and the chest closed.

After the operation she was comatose and spastic with athetoid movements of the limbs and bilateral extensor plantar responses. Her breathing was stertorous and there was excessive bronchial secretion. A tracheostomy was performed. The blood-pressure was 120/80 mm. Hg. 8 hours later she was still comatose but the spasticity was less, and after 14 hours she recovered consciousness. Her progress was slow but her cardiovascular state was satisfactory on the pacemaker at 80 with a blood-pressure of 120/70 mm. Hg and resolution of heart-failure in 48 hours. At this stage she had retrograde amnesia of 1 month which has since resolved. Now the only evidence of neurological damage is slight word-finding difficulty.

For the first 2 months after operation, although idioventricular rhythm started as soon as the pacemaker was switched off she lost consciousness almost immediately and pacemaking by the Lillehei method was therefore continued. It was also found possible to control the heart-rate through the inductive coupling. After 8 weeks she no longer became unconscious when the pacemaker was turned off, but felt faint and apprehensive and became pale; the pulse-rate was 22. At that time she was walking about the ward and going home for the day with her pacemaker. After 3 months it was noted that when the pacemaker was switched off she remained conscious and did not suffer faintness for periods of an hour at her idioventricular rate of 24. Control with the inductively coupled pacemaker has been achieved at every attempt and she can now apply it herself.

### THE SECOND CASE

A factory supervisor, aged 60, underwent prostatectomy for benign hypertrophy in October, 1958, at which time his pulse-rate was 88 and no cardiovascular abnormality was noted. He was well until 6 days before transfer to this hospital, on April 14, 1960, when, in the afternoon, he had a series of attacks during which he felt a hot flush spreading from the chest to the temples, associated with a throbbing in the head, and a sensation of jerking movement of his arms, which he knew were still.

During the next 4 days he had several such attacks culminating in one which began as the others, but in which he lost consciousness. His wife observed that his eyes became glazed; he dropped his cup and slumped forward in his chair. His own doctor was called and observed a further such attack during which he was pulseless for 30 seconds and on recovery had an irregular pulse. He was admitted to another hospital that evening, by which time eighteen further attacks had occurred. He had a regular pulse of 88 with periods of absent pulse lasting 4–5 seconds not associated with symptoms. A diagnosis of Stokes-Adams seizures was made.

An electrocardiogram next morning showed an atrial rate of 100 and periods of grade-I heart-block with a PR interval of 0·2 second, the Wenckebach phenomenon, 3-to-1 heart-block, and periods of ventricular asystole. He was treated with ephedrine but his attacks continued and he was transferred here 48 hours later.

On examination he was alert and cooperative. His pulse was regular (rate 108) and his blood-pressure was 120/90 mm. Hg. The heart was not enlarged, the sounds were normal, and there were no murmurs. He had chronic bronchitis and emphysema. There was no evidence of cardiac failure. During examination he said "I'm going" and lost consciousness. A period of asystole lasting 30 seconds was observed. A regular pulse returned at a rate of 65 and was associated with reactive hyperæmia. It was decided to pass a cardiac catheter electrode for pacemaking and he was heparinised. The catheter electrode could not be made to enter the right ventricle. Two further Stokes-Adams seizures occurred; so immediate thoracotomy and insertion of pacemaker electrodes was performed. A secondary coil was also inserted.

He had no further attacks while on the pacemaker at a rate of 85. Next day the pacemaker rate was reduced to 70 and the pulse was observed to become irregular owing to interference by the natural sino-auricular pacemaker. When the pacemaker was switched off, sinus rhythm (rate 80) with periods of asystole causing faintness, was observed. It was found that when the artificial pacemaker rate was reduced to 60 no interference with the natural rhythm occurred but asystole was prevented, being replaced by periods of pacemaker control. No further Stokes-Adams seizures occurred on this regime. After a week the pacemaker was switched off during the day and the patient switched it on at the onset of faintness and whenever he wanted to sleep. After 2 weeks the attacks ceased but he continued to use the pacemaker at night. A week later pacemaking was stopped and he remained in sinus rhythm. The percutaneous electrodes were removed.

During the postoperative period repeated trials of the inductive coupled pacemaker were made. Increase of the heart-rate was always achieved and the patient has learned to apply it himself.

### THE THIRD CASE

A man of 66, an engineering representative, had suffered from chronic bronchitis since childhood. 5 years ago he became breathless on effort; 4 years ago a diagnosis of hypertensive heart-disease was made and he was digitalised. Last December his breathlessness on effort increased and he became orthopnœic. He developed congestive cardiac failure which responded temporarily to diuretics. At that time he had a slow pulse and an electrocardiogram showed 2-to-1 heart-block.

He was admitted to another hospital on April 6 in severe congestive cardiac failure. His pulse was regular (rate 32) and his blood-pressure was 210/90 mm. Hg. The heart was enlarged and there was an apical systolic murmur conducted to the axilla. On April 7 an electrocardiogram showed complete heart-block with an idioventricular rate of 35. His mental state was dull and his manner aggressive. There was no history suggesting Stokes-Adams seizures. There was some response to chlorothiazide,

and, when he was transferred to this hospital, his cardiac failure was resolving.

It was thought that he might benefit from artificial cardiac pacemaking and he was given phenindione preparatory to a study of his cardiac output during pacemaking. On April 14 a cardiac-catheter electrode was passed from the right arm to the right ventricle. Pacemaking was achieved at 0·5 volts. A double-lumen cardiac catheter was passed from the left arm so that simultaneous pulmonary-artery and pulmonary-wedge pressures could be recorded. A needle was inserted in the right brachial artery. Direct Fick cardiac outputs were measured at his idioventricular rate of 30 and at pacemaker rates of 51, 72, and 95 (fig. 4). At a pacemaker rate of 72, coincidental with a rise in cardiac output and a drop in pulmonary-arterial and pulmonary-wedge pressures, the patient had striking relief of tightness in the chest and his orthopnœa ceased.

In view of these findings cardiac pacemaking with the intracardiac electrode was continued at 72. The next morning the patient was lucid, cooperative, and pleasant in manner. 4 days later, the pacemaker became ineffective and he had developed basilic-vein thrombosis, although his anticoagulant therapy was apparently adequate. He had an idioventricular rate of 46. The next day thoracotomy for insertion of pacemaking electrodes and a secondary coil was carried out. When the pericardium was opened the fluid was brown and 15 cm. of cardiac catheter was found protruding through the wall of the right ventricle. When the catheter was removed there was no bleeding from the heart.

After the operation, pacemaking by Lillehei's method was continued at a rate of 72. The inductive coupled pacemaker also controlled his heart satisfactorily. His heart-failure has now resolved and he is getting up. His breathlessness is less than at any time since last December. When his pacemaker is switched off he now develops idioventricular rhythm immediately (fig. 5), at a rate of 42, without faintness; breathlessness returns after 2 hours of idioventricular rhythm and is relieved by pacemaking. He is now using his inductive coupled pacemaker as a cardiac aid and is not breathless walking about the ward.

**Fig. 5—Continuous electrocardiographic record in case 3 showing, from left to right, Lillehei pacemaking, idioventricular rhythm, and inductive pacemaking (the biphasic pulse is seen). Idioventricular rhythm occurs immediately after switching off the pacemaker.**

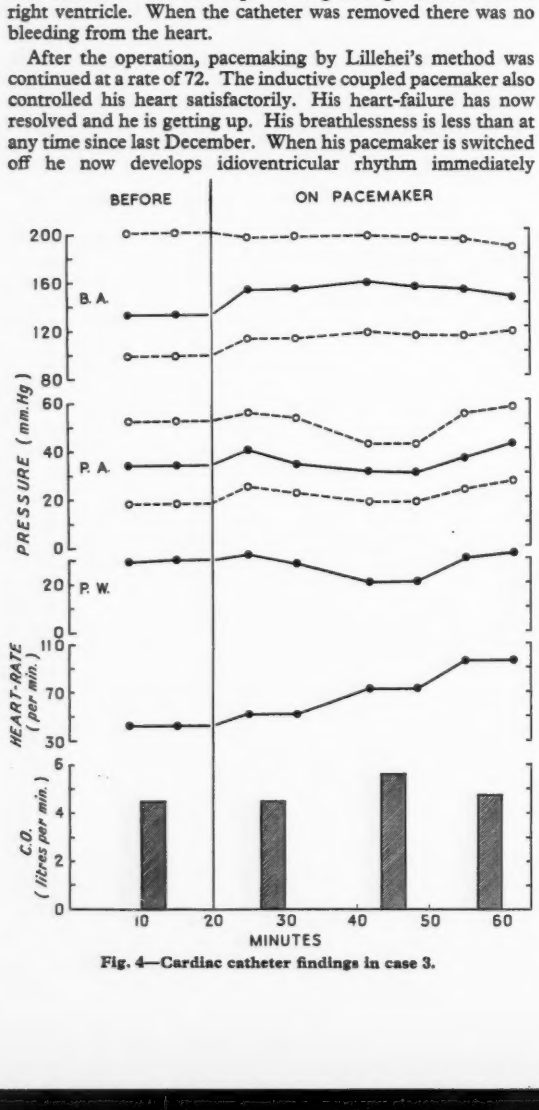


**Fig. 4—Cardiac catheter findings in case 3.**

## Discussion

Artificial cardiac pacemaking by Lillehei's method seems to be indicated for Stokes-Adams seizures which threaten life. After a period of pacemaking, patients with this disease may revert to sinus rhythm or develop idioventricular rhythm without episodes of asystole. In either case there is a likelihood of further Stokes-Adams seizures and in the latter the cardiac output may be low. Artificial cardiac pacemaking by means of permanent percutaneous electrodes is undesirable. The method presented here overcomes this disadvantage and those of the other methods mentioned. It has the advantage that pacemaking is optional and that the rate and intensity of the electrical pulse is controllable. There are reports that the voltage necessary for pacemaking increases with time, owing to polarisation of the electrodes. None of our patients has required an increase of voltage since operation, but the longest period is only 4 months. The biphasic form of the pulse produced by the inductive coupling may help to minimise polarisation. The advantages of this method make it suitable for use as a safeguard against further Stokes-Adams seizures or as a cardiac aid for the correction of low output due to idioventricular rhythm. We hope that improvements in technique will make this method suitable for permanent pacemaking. P-wave control of the rate of a cardiac pacemaker has been achieved (Folkman and Watkins 1957). We intend to apply this physiologically desirable refinement to inductive coupled pacemaking.

## Summary

The treatment of heart-block by artificial cardiac pacemaking is discussed. Three cases are reported. Two of these suffered repeated Stokes-Adams seizures threatening life. The third had low cardiac output due to idioventricular rhythm.

Their successful treatment by artificial cardiac pacemaking is described and a method of painless artificial cardiac pacemaking through the intact skin is presented.

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We wish to thank Prof. W. Melville Arnott for facilities in his department, and Dr. N. Segel, who carried out the cardiac catheterisation and prepared fig. 4. We thank Mr. T. F. Dee for the photographs.

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# PNEUMONIA WITH ANTIBODIES TO STREPTOCOCCUS MG

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SINCE the late '30s clinicians have been interested in atypical pneumonia. This is usually a benign disease for which no bacterial cause can be found; it does not respond to chemotherapy or treatment with antibiotics. The increase in knowledge of the disease has been ætiological: rickettsiæ, as in Q fever, and viruses, such as the adenovirus, have been associated with atypical pneumonia. There remains a group of pneumonias of obscure ætiology, in many ways similar to known viral infections.

The search for the cause of atypical pneumonia began with the isolation of a virus from cases of the disease by Eaton et al. (1944). Liu (1957) claimed to have isolated a virus in the developing chick embryo; this virus was antigenically similar to Eaton's virus. Cook et al. (1960) refer, not to "Eaton's virus", but to "Eaton agent".

Cook et al. showed a fairly constant relationship between pneumonia associated with cold-agglutinins or *Streptococcus* MG antibodies and the presence of Eaton agent. They infer that Eaton agent is a cause of atypical pneumonia; the finding of cold-agglutinins and *Streptococcus* MG antibodies are both non-specific. In general practice, the study of atypical pneumonia must depend on the finding of *Streptococcus* MG antibodies, as the testing for cold-agglutinins presents technical hazards which are difficult to overcome.

Cook et al. (1960) subdivided cases of primary atypical pneumonia into those with negative serology and those that are cold-agglutinin-positive or *Streptococcus*-MG-positive. The 20 cases described here fall into the latter group; for brevity they will be described as cases of *Streptococcus* MG pneumonia, without intending to infer that the *Streptococcus* MG is the cause of the disease.

### Illustrative Case-records

**Case 18.**—An unmarried female veterinary assistant, aged 36, had pulmonary tuberculosis in 1948 when she was a hospital nurse; she was treated for 6 years by a right artificial pneumothorax and the disease had remained inactive. On Sept. 29, 1958, she felt slight malaise, limb pains, and slight frontal headache, and had several rigors. She was pyrexial and went to bed. On the 3rd day of illness she noted pain in her left chest, unaffected by respiration but worse if she lay on her left side.

The patient, examined at home on the 4th day of illness, had a temperature of 100·2°F, pulse-rate 100 per minute, and respiration-rate 20 per minute. She was pale but not cyanosed; the conjunctivæ, nasopharynx, and cervical glands were clinically normal. The chest was normal, though the left base moved less than the right. Symptomatic treatment only was given.

On the 5th day her pain had gone and she felt better; she started to cough without sputum, but she had no rigors. A few râles were heard at the right base. After that her condition deteriorated; her temperature was 99–100·°F but rose to 102°F with rigors, of which she had several each day. The cough and headache increased gradually; there were only small amounts of mucoid sputum. On the 8th day the right lung base was dull to percussion, the breath sounds were diminished, and scattered râles and inspiratory crepitations were heard. These signs increased in extent until the 10th day when she was examined by a chest physician, who reported patchy opacity in the left lower zone in the chest radiograph. Tetracycline, 250 mg. q.d.s., was given for the next 5 days; her symptoms, notably the cough, decreased and she was allowed up for short periods. On the 17th day a chest radiograph showed no diminution in the shadow in the left lower zone; the chest physician recommended further tetracycline, which was given as before for 5 days (total dose 10 g.).

Recovery was not complete until the 4th week, and the patient returned to work 35 days after the onset. She relapsed immediately with influenza-like symptoms and slight soreness of the throat. That evening her temperature was 100·2°F; she had granular pharyngitis and moist sounds at both bases. Nose and throat swabs were taken and benzylpenicillin 2,000,000 units were given by intramuscular injection; 1,000,000 units were given twice daily for the next 4 days (total dose 10 million units). 8 weeks from the onset of the original illness she was clinically and radiologically normal and she returned to work. Since then she has remained in normal health.

*Laboratory Findings*

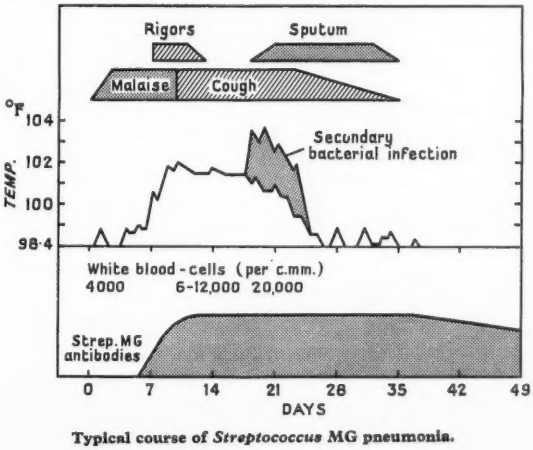
Nose and throat swabs (4th and 36th day) did not reveal any pathogens. Sputum (10th day) showed a scanty growth of normal upper-respiratory organisms. Blood examination (4th day): hæmoglobin 12·7 g. per 100 ml.; red-cell count normal; white cells 6800 per c.mm., differential count normal.

Serum taken on the 4th, 14th, 22nd, and 34th days of the illness agglutinated *Streptococcus* MG at these dilutions: <10, <10, 10, 40.

**Case 19.**—A housewife, aged 32, with no significant past history, on Jan. 14, 1959, felt a dull pain in the back and was shivery; there was no coryza or sore throat. On the 4th day of illness she started to cough, without sputum at first but later raising about one ounce daily of colourless sputum. During this 1st week the shivering and back pain persisted and there was increasing malaise. She sweated heavily at nights, even without aspirin. She was breathless going upstairs; there was no chest pain but a slight dragging pain in the lower abdomen. She kept about until the 8th day when she had a frontal headache and felt so wretched that she called the doctor.

On examination the temperature was 100°F, pulse-rate 84 per minute, and respiration-rate 27 per minute. She was pale and hollowed-eyed but not cyanosed. The conjunctivæ were normal; there was enlargement of the lymphoid tissue on the posterior pharyngeal wall, but the throat was not red. The right tonsillar lymphatic gland was palpable. The chest showed a funnel deformity, and moved symmetrically. The left lung base was dull to percussion posteriorly; breath sounds and vocal resonance were diminished over this area, and inspiratory crepitations were heard here and towards the midaxillary line.

A normal temperature was recorded on the 13th day; the cough was persisting but the sputum was easier to raise and was occasionally mucopurulent. The signs at the left base had disappeared except for râles; these persisted until the 16th day




**Typical course of *Streptococcus* MG pneumonia.**

when she was allowed up. This patient received symptomatic treatment only.

She was examined by the chest physician on the 16th day; posteroanterior and left lateral radiographs showed a patchy opacity in the lingula. Her symptoms persisted for several more days, but 2 weeks later her chest radiograph was normal.

*Laboratory Findings*

Throat washings (8th day) contained no bacterial pathogens. Blood examination (8th day): hæmoglobin 12·4 g. per 100 ml.; red-cell count normal; white cells 7000 per c.mm., differential count normal.

Serum taken on 8th and 17th days agglutinated *Streptococcus* MG at dilutions of 80 and 320.

## Clinical, Radiological, and Laboratory Findings

*Clinical Findings*

Certain clinical features common to these 20 cases made bedside diagnosis possible. The course of the disease is summarised broadly in the accompanying figure.

The period of onset, from the first symptoms to the clinical recognition of pneumonia, was always a matter of days rather than hours; this is illustrated in table I.

TABLE I—PERIOD OF ONSET

| Onset (days) | No. of cases |
|---|---|
| <5 | 7 |
| 5–10 | 8 |
| >10 | 5 |

Of the 20 patients, 16 were so ill that they could not leave their beds for at least 10 days; the rest were able to get up within a week. This constitutes one main difference between *Streptococcus* MG pneumonia and other common respiratory diseases seen in general practice.

There was no significant sex difference, 12 cases being in females and 8 in males; the majority of the patients were between 20 and 55 years of age.

The clinical features of the 20 cases are summarised in tables II and III.

Symptoms or signs of upper-respiratory infection were not frequent, but when such inflammation was present it was slight. None of the patients had a heavy cold or a very sore throat as an early symptom. Some recalled having slight coryza or discomfort in the throat; in the majority the illness started as a "touch of 'flu" or "a chill". Examination of the upper-respiratory tract showed little abnormality; pus in the nose, œdema or reddening of the nasopharynx, or tender enlargement of cervical glands were never present.

TABLE II—SYMPTOMS

| Type | Symptom | No. of cases |
|---|---|---|
| General | Headache | 15 |
| | Limb pains | 13 |
| | Lassitude | 17 |
| | Night sweats | 14 |
| | Rigors | 10 |
| Respiratory | Cough | 20 |
| | Coryza | 8 |
| | Sputum (early) | 4 |
| | Sputum (late) | 12 |
| | Sore throat | 4 |
| | Chest pain | 11 |
| | Dyspnœa | 5 |
| Alimentary | Anorexia | 16 |
| | Vomiting | 3 |
| | Abdominal pain | 2 |

TABLE III—SIGNS

| — | Sign | No. of cases |
|---|---|---|
| | Fever | 17 |
| | Nasopharyngeal injection | 3 |
| Pulmonary | Bronchitis | 2 |
| | Pneumonia | 19 |
| | Collapse | 2 |
| Radiological | Pneumonia | 20 |
| | Collapse | 3 |
| | Effusion | 1 |

The influenza-like symptoms lasted usually for a few days: malaise, heaviness and aching of the limbs, and generalised headache were later overshadowed by prostration, cough, rigors, and night sweats. 2 patients had pleuritic pain in the first few days of their illness; both had signs of segmental collapse. 9 others had a dull, diffuse pain not related to respiration. The cough was usually violent, spasmodic, and unlike the half-suppressed grunt heard in lobar pneumonia. Because the cough was persistent, the patients lost sleep and became exhausted and hollow-eyed. At first, there was little or no sputum; later it increased but remained mucoid during the 2nd and 3rd weeks of the illness. As the sputum increased the cough became less troublesome. In 4 cases recovery was interrupted by a relapse due to secondary bacterial infection: the cough increased, there was much mucopurulent sputum, and there were signs of bronchitis (3 cases) or of bronchopneumonia (1 case). Slow progress towards recovery usually began in the 2nd week, and after the 3rd week there were no respiratory symptoms except slight cough. Debility in convalescence was roughly proportional to the period of decubitus.

The pulmonary physical signs suggested a slowly developing inflammatory process, often patchy, never reaching consolidation, and usually not resulting in obstruction of air passages to an extent detectable by auscultation. Impairment of percussion note was seldom lobar in extent, and was commonly found at the lung bases. The breath sounds were at first normal or slightly reduced; after 24 to 48 hours fine to medium râles were heard in these areas. Voice conduction was normal or slightly reduced, but there were sometimes small patches of increased resonance and whispering pectoriloquy. After 2 or 3 more days, fine crepitations were heard on deep inspiration; these disappeared gradually, over a variable period, leaving clinically normal lung.

With so little respiratory embarrassment, signs of inadequate ventilation were few: slight cyanosis was occasionally seen, but forced, shallow breathing was never observed.

*Radiological Findings*

All the cases were examined clinically and radiologically by a chest physician. The radiological picture was that of bronchopneumonia, but in 3 cases there was segmental collapse; 1 such case, in a child aged 8 years, showed hilar gland enlargement which subsided after 10 days. Another case, presenting in the late stage of secondary bacterial infection, showed a dense basal shadow which was thought due to bronchial carcinoma; but the shadow diminished with penicillin therapy and eventually disappeared in 4 weeks. In 1 case there was radiological evidence of pleural effusion.

In 14 cases the sinuses were examined radiologically; there were no dense opacities or fluid levels to suggest inflammatory disease.

*Laboratory Findings*

*White-blood-cell counts* were made in 8 cases only, usually as a diagnostic aid in the first day or two after pneumonia had been diagnosed. In such cases the count was on the low side of normal; the differential count was

TABLE IV—DILUTIONS OF SERA AGGLUTINATING STREPTOCOCCUS MG

| Case no. | Days of illness | | | |
|---|---|---|---|---|
| | 0–5 | 6–13 | 14–20 | 21 or more |
| 1 | <10 | 80 | .. | .. |
| 2 | <10 | 40 | .. | .. |
| 3 | .. | .. | 40 | 20 |
| 4 | .. | .. | 320 | 320 |
| 5 | .. | 80 | .. | .. |
| 6 | .. | 40 | .. | .. |
| 7 | .. | 40 | .. | .. |
| 8 | .. | 40 | .. | .. |
| 9 | .. | .. | 160 | .. |
| 10 | <10 | 20 | .. | .. |
| 11 | .. | .. | .. | 20 |
| 12 | .. | .. | 80 | .. |
| 13 | .. | 80 | .. | 80 |
| 14 | 20 | .. | .. | 80 |
| 15 | .. | .. | 80 | .. |
| 16 | <10 | .. | 40 | .. |
| 17 | .. | 40 | 40 | .. |
| 18 | <10 | <10 | 20 | 40 |
| 19 | .. | 80 | 320 | .. |
| 20 | 20 | 40 | 80 | .. |

normal, or there was a relative decrease in polymorphs. In no case was the count higher than 12,000 cells per c.mm.

*Serological findings.*—Serum was examined in all cases; in some single specimens were taken; in others two or more specimens were taken at intervals of about a week. Serological examination included tests for complement-fixing antibody to influenza virus A and B, the lymphogranuloma-venereum and ornithosis group of viruses, *Rickettsia burneti*, and latterly the adenoviruses. None of the sera contained antibodies to these organisms at a significant level. The antibodies to *Streptococcus* MG were estimated by a modification of the method of Thomas et al. (1945); these results are summarised in table IV. In cases with paired sera, a fourfold increase in titre was usual; in single sera a titre of 1/40 or higher was diagnostic. The exception was case 11, which is included because of the clinical resemblance between his disease and that of his mother (case 10). Case 13, a chronic bronchitic, was found to have a titre of 1/80 on two occasions, 12 and 30 months after his illness; 3 years after his pneumonia he was subjected to pneumonectomy for removal of bronchial carcinoma. The slow development of antibodies in case 18 suggests that absence of antibodies in the 2nd week does not preclude the diagnosis of *Streptococcus* MG pneumonia. In no case was the titre related to the clinical severity of the disease.

*Sputum examination.*—Naked-eye examination of the sputum at the bedside was often helpful in studying the course of the disease; it was commonly mucoid except when bacterial infection supervened; hæmoptysis was not observed. 2 patients coughed up bronchial casts, which have formerly been associated with the diagnosis of plastic bronchitis. Bacteriological examination of the sputum was made in 9 cases; the majority yielded no predominant organism; from 1 *Strep. viridans* was isolated.

## Differential Diagnosis

Early clinical diagnosis of *Streptococcus* MG pneumonia is important because of the delay in reaching a serological diagnosis. The differential diagnosis includes other common respiratory infections, which differ from virus pneumonia on the following points:

*Viral Infections*

*Influenza.*—This occurs sporadically, but more often in widespread and sometimes violent epidemics. The clinical features are varied, but it has a sudden onset and there are signs of inflammation of the nasopharynx at some stage of the illness. Influenzal pneumonia is nearly always of rapid onset, occurring within a few hours of the beginning of the primary illness. It is usually associated with secondary bacterial infection, which is often staphylococcal (Stuart-Harris 1953).

*Measles.*—This may be mistaken for *Streptococcus* MG pneumonia before the rash erupts. Rashes are described in virus pneumonia, but these are usually urticarial or purpuric.

*Adenovirus infections.*—The pulmonary physical and radiological signs of these infections are indistinguishable from those of other viral pneumonias; inflammation of the nasopharynx, cervical glands, or the conjunctivæ are diagnostic features.

*Bacterial Infections*

*Lobar pneumonia.*—" Classical " pneumonia is seldom seen in general practice nowadays. It is commonly due to the pneumococcus. It is rapid in onset, there are signs of lobar consolidation, and the pleuritic pain is responsible for suppression of cough and respiratory movement. Such suppression and the loss of respiratory volume by consolidation lead to cyanosis and severe respiratory embarrassment, which are not often seen in *Streptococcus* MG pneumonia.

*Bacterial bronchopneumonia.*—Whatever the causal organism in this disease, the clinical features are fairly constant, though bacterial bronchopneumonia varies in degree and severity. It is most often found in very young or old or debilitated patients. Loss of resistance to invasion by organisms in the upper respiratory tract is the factor allowing the development of pneumonia; viral infections as a whole may induce this change. Influenza is the commonest precursor, but *Streptococcus* MG pneumonia may itself be responsible for bacterial bronchopneumonia.

*Pertussis.*—The spasmodic cough of this disease, when not accompanied by a whoop, sets a problem which can be solved only in the laboratory. It is more easily recognised during epidemics, and only occasionally affects adults. It is even more insidious than *Streptococcus* MG pneumonia; pulmonary physical signs in pertussis are often normal.

*Pulmonary tuberculosis.*—This used to be confused with viral pneumonia on radiological examination. The general practitioner is more likely to mistake *Streptococcus* MG pneumonia for pulmonary tuberculosis than the reverse. Malaise, lassitude, fever, night sweats, and cough are common to both diseases; amelioration with bed rest is more rapid in tuberculosis than in *Streptococcus* MG pneumonia.

## Discussion

*Streptococcus* MG pneumonia is a clinical entity; it runs a slow course and there are usually no signs of upper respiratory infection. According to Stuart-Harris (1953) *Streptococcus* MG antibodies are evoked only by the causal virus or group of viruses. Cook et al. (1960) implied that such antibodies were associated with the presence of Eaton agent.

*Cause*

Liu et al. (1957, 1959) have isolated a virus from cases of atypical pneumonia; they isolated fresh strains in the fertilised chick embryo and have shown a constant antigenic relationship between these strains and Eaton's virus. There is no antigenic relationship between this virus and *Streptococcus* MG.

Cook et al. (1960), using the method described by Liu, have made independent isolations, but prefer the term Eaton agent to Eaton's virus. Antibody to Eaton agent developed in 22 out of 26 cases of pneumonia with cold-agglutinins or *Streptococcus* MG antibodies. Antibodies to Eaton agent were found in 26% of atypical pneumonias, without cold agglutinins or *Streptococcus* MG antibodies.

*Significance of Streptococcus MG Antibodies*

If Eaton agent is the primary cause of *Streptococcus* MG pneumonia, it may also cause pneumonia without evoking the production of these antibodies. *Streptococcus* MG is a non-pathogenic streptococcus, of the *Strep. salivarius*

group, commonly found in the mouths of healthy subjects. It may act as a secondary invader in pneumonia caused by Eaton agent, but not by other respiratory viruses. Thomas et al. (1945) found *Streptococcus* MG in the lungs of 6 out of 8 patients who had died from atypical pneumonia; they were not able to isolate it from patients who had died from other causes. This suggests that *Streptococcus* MG may have a pathogenic function in this type of pneumonia.

Wormald et al. (1956) showed that *Streptococcus* MG antibodies were present in significant amounts in the sera of subjects who had no recollection of recent respiratory illness. Liu et al. (1959) showed that antibody to Eaton agent decreased rapidly 3–4 months after the infective illness. *Streptococcus* MG antibodies disappear at a comparable rate, though rarely they may persist at a high level at 12 months; case 13 in this series showed antibodies, at a dilution of 1/80, 2 years after the initial infection. There is some evidence that *Streptococcus* MG antibodies, already present, may be increased by other intercurrent infections.

*Incidence*

In my practice (urban, with some 3000 patients) 124 cases with lower respiratory illness were investigated serologically between January, 1952, and December, 1959. In 53 cases the serological findings were significant: in 21 *Streptococcus* MG antibodies were found; serological diagnoses in the remainder were influenza (12), adenovirus infection (2), and inconclusive (18).

In 36 cases the initial clinical diagnosis was *Streptococcus* MG pneumonia; in 17 of these, the diagnosis was confirmed by finding *Streptococcus* MG antibodies. The diagnosis was made with greater frequency and accuracy during the East Anglian outbreak of *Streptococcus* MG pneumonia described by Wormald et al. (1956).

*Treatment*

Most cases recover with rest in bed, some without even this treatment; 2 of the cases in this series were ambulant throughout the illness, and a 3rd did not seek medical advice until he was laid low by secondary bacterial pneumonia. Treatment of virus pneumonia with sulphonamides and penicillin has been recognised as valueless since their use became widespread. These drugs may be actually harmful early in the disease; this is inferred by Auerbach et al. (1952), and Parker et al.'s (1947) crop of 8 postmortem cases had all had full courses of treatment with a sulphonamide.

The contention that tetracyclines and similar wide-acting antibiotics have a specific action against this infection cannot be upheld. On the other hand no published report has suggested that they are harmful, which means that they can be used with safety in general practice; as the patient with virus pneumonia may often be alarmingly ill, the use of tetracyclines may be a comfort to the physician.

### Conclusions

*Streptococcus* MG pneumonia is a complication of an infection which commonly manifests itself as a minor respiratory illness. Incubation probably takes 2–3 weeks, and there is little evidence of nasopharyngeal inflammation by the time that signs of pneumonia are detectable. The pneumonia runs a slow course, which may last 2 or more weeks; severe unproductive cough is the main symptom. Painful pleural involvement, as in bacterial pneumonias, is rare. Secondary bacterial infection may complicate convalescence; the resulting disease is clinically a bronchopneumonia with much mucopurulent sputum.

The white-blood-cell count is usually normal in the early days of the disease, and in the absence of secondary bacterial infection counts above 10,000 per c.mm. are rare.

The disease is associated with the production of antibodies to *Streptococcus* MG; these reach a maximum in the second week or later.

More accurate laboratory methods of investigating *Streptococcus* MG pneumonia and allied diseases have been devised, but are too intricate for use in routine diagnostic laboratories. Further additions to knowledge—concerning particularly the epidemiology, morbidity, and role of *Streptococcus* MG in this disease—may depend on more extensive use of laboratory tests. Nevertheless, the diagnosis of *Streptococcus* MG pneumonia must be clinical; it can be made earlier by the general practitioner than by other clinicians.

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## FATTY-ACID DISTRIBUTION IN LIPIDS OF THE AORTIC WALL

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IN a previous paper (Böttcher et al. 1958) we presented some preliminary results of our analysis of lipids of the aortic wall at various stages of atherosclerosis. At that time the analysis of the fatty-acid compositions of different lipid fractions could not be considered complete, for fatty acids having the same chain length but different degrees of unsaturation could not be satisfactorily separated by gas chromatography. The advent of polyester stationary phases shortly afterwards made this possible. A second series of analyses utilising these phases, and incorporating various other modifications and improvements into the analytical methods, led to the more detailed results which are presented here.

### Methods

Twenty-eight aortas, obtained from necropsy material, were used. No material was accepted from patients who had been suffering from diseases known to be associated with gross disturbances of lipid metabolism. Some, but not all, of the youngest (1–5 years) aortas had to be combined to provide sufficient lipid for analysis.

The whole of the aorta, from directly behind the aortic valves to the iliac bifurcation, was used; the aortas were inspected and prepared in a fresh state. The external elastic membrane of the media, together with the adhering adventitia, was removed with the aid of a dissection microscope. The inclusion of most of the media with the intima in the material for analysis ensures, as formerly pointed out (Böttcher et al. 1958), strict comparability of the results for all stages of the disease.

The material was divided into four groups according to the macroscopic aspect of the aortic wall (Buck and Rossiter 1951, terminology modified in accordance with Classification of Atherosclerotic Lesions, W.H.O. 1958), as follows:

Stage O: no atherosclerotic lesions discernible at a magnification of 10.

Stage I: fatty streaks and/or spots present.

Stage II: fibrous plaques and/or atheroma present.

Stage III: lesions as above, with additional complications—e.g., ulceration, necrosis, hæmorrhage, thrombosis.

The prepared material was cut into small pieces and freeze-dried. Extraction and analysis of the lipids into phospholipids, free fatty acids (F.F.A.), cholesterol esters (C.E.), and glycerides plus free sterols, and methylation of the fatty acids obtained from these four fractions, followed the methods described elsewhere (Böttcher et al. 1959b). Gas chromatography of the methyl esters was carried out on two columns prepared as there described, except for the use of a $\beta$-ray ionisation detector (W. G. Pye & Co.) instead of a gas-density balance and column temperatures of 204°C and 185°C for the non-polar (Apiezon L) and polar (maleic acid-adipic acid ethylene glycol polyester) phases respectively. Fatty acids were identified and estimated by correlating for each methyl-ester mixture the chromatograms obtained from both stationary phases.

The fatty acids found in C.E., F.F.A., and glyceride fractions of the lipids were on the whole well known and easily recognised, but those from the phospholipids contained a number of $C_{22}$ and $C_{24}$ acids which have not yet been completely isolated and identified. The formulæ of some of the phospholipid higher fatty acids in table II are therefore tentative, having been assigned on theoretical grounds from the gas-chromatographic observations. In making these attributions, the consideration of "carbon-numbers" on two dissimilar stationary phases (Woodford and van Gent 1960) was useful. Work on these identifications is continuing.

TABLE I—COMPOSITION OF LIPIDS FROM 23 AORTA PREPARATIONS AT DIFFERENT STAGES OF ATHEROSCLEROSIS

| — | Stage of disease* | | | | s† | P† |
|---|---|---|---|---|---|---|
| | O | I | II | III | | |
| No. of samples | 6 | 6 | 6 | 5 | .. | .. |
| Average age (years) | 4·7 | 20 | 56 | 51 | .. | .. |
| Average weight of lipids analysed (mg.) per preparation | 44 | 108 | 638 | 1634 | .. | .. |
| Lipids as percentage of dry tissue (mean) | 3·0 | 4·2 | 9·8 | 12·0 | 4·6 | <0·0001 |
| Mean composition of lipids‡: | | | | | | |
| %Phospholipids | 61·3 | 58·4 | 42·3 | 38·0 | 8·5 | <0·0001 |
| %Free fatty acids | 8·5 | 4·2 | 1·4 | 1·0 | 3·5 | <0·0001 |
| %Free cholesterol | 8·0 | 12·7 | 16·3 | 19·3 | 3·3 | <0·0001 |
| %Cholesterol esters | 5·6 | 12·3 | 30·2 | 33·8 | 7·4 | <0·0001 |
| %Triglycerides | 16·8 | 12·9 | 10·0 | 9·7 | 4·2 | <0·0005 |

* For definition of stage of disease, see Methods.
† s = standard deviation calculated from the residual variance in the analysis of variance; it gives a pooled value of the standard deviations for all four stages. P is the level of significance in the variance analysis.
‡ Phospholipids and free fatty acids were estimated gravimetrically, cholesterol and triglycerides from colorimetric determinations of cholesterol and glycerol respectively. For aorta lipids, the terms "cholesterol esters", "free cholesterol", and "triglycerides" are for practical purposes synonymous with "sterol esters", "free sterol" and "glycerides", since we have found that the sterol-ester fraction contains negligible quantities of sterols other than cholesterol; the free-sterol fraction not more than 4% of other sterols, mostly cholestanol (Woodford, unpublished results); and the glyceride fraction not more than 2% of mono- and diglycerides. Nevertheless, the terms are used strictly in this paper according to the context in which they appear.

TABLE II—MEAN FATTY-ACID COMPOSITION OF LIPID FRACTIONS FROM UNDISEASED AND ATHEROSCLEROTIC AORTAS

| Lipid fraction | Cholesterol esters | | Glycerides | | Free fatty acids | | Phospho-lipids | |
|---|---|---|---|---|---|---|---|---|
| Stage of disease | O | II | O | II | O | II | O | II |
| No. of samples | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 |
| Fatty acids*: | | | | | | | | |
| 10:0 | .. | .. | 0·1 | .. | 0·1 | .. | 0·1 | .. |
| 12:0 | 0·3 | 0·2 | 0·9 | 1·0 | 0·8 | 0·6 | 0·1 | .. |
| 14:0 | 1·9 | 1·4 | 3·5 | 3·4 | 2·5 | 1·8 | 0·6 | 0·8 |
| 14:1 | 0·1 | .. | 0·1 | 0·1 | .. | 0·1 | .. | .. |
| br-15:0 | 0·4 | 0·1 | 0·3 | 0·3 | 0·1 | 0·2 | .. | .. |
| 15:0 | 0·6 | 0·2 | 0·9 | 0·4 | 0·5 | 0·4 | 0·2 | 0·2 |
| 15:1 | 0·2 | 0·1 | 0·3 | .. | 0·3 | .. | 0·1 | .. |
| 16:0 | 21·5 | 13·7 | 25·8 | 21·6 | 21·1 | 17·7 | 24·8 | 29·7 |
| 16:1 | 8·2 | 5·7 | 5·4 | 6·1 | 3·4 | 3·5 | 1·4 | 0·9 |
| 17:0 | 0·5 | 0·4 | 0·6 | 0·5 | 0·7 | 0·4 | 0·8 | 0·9 |
| 17:1 | 0·7 | 0·5 | 0·7 | 0·6 | 0·5 | 0·3 | 0·3 | 0·4 |
| 18:0 | 5·7 | 1·9 | 11·9 | 7·3 | 18·0 | 16·2 | 20·0 | 14·8 |
| 18:1 | 29·6 | 28·3 | 32·6 | 40·1 | 23·7 | 23·1 | 14·7 | 9·8 |
| 18:2 | 24·5 | 37·0 | 9·6 | 10·8 | 17·6 | 15·7 | 5·0 | 3·9 |
| 18:3 | 0·4 | 0·6 | 0·1 | 0·4 | 0·8 | 0·5 | .. | .. |
| 20:0 | 0·2 | 0·4 | 0·4 | 0·2 | 0·3 | 0·3 | 1·5 | 1·8 |
| 20:1 | 0·9 | 0·2 | 1·1 | 0·7 | 0·6 | 0·7 | 0·8 | 0·6 |
| 20:2 | 0·1 | 0·3 | 0·3 | 0·5 | 0·4 | 0·2 | 1·1 | 0·5 |
| 20:3 | 1·2 | 2·2 | 0·6 | 0·6 | 0·7 | 1·6 | 2·1 | 1·7 |
| 20:4 | 2·1 | 5·1 | 2·7 | 2·9 | 5·5 | 12·1 | 9·9 | 9·4 |
| 20:5 | 0·2 | .. | 0·3 | 0·2 | 0·2 | 0·4 | 2·1 | 1·1 |
| 22:0 | 0·1 | 0·3 | 0·6 | .. | 0·5 | 0·2 | 1·6 | 4·5 |
| 22:1 | 0·2 | 0·5 | 0·2 | 0·5 | 0·1 | 0·3 | 1·0 | 1·5 |
| 22:2 | .. | .. | .. | 0·1 | 0·1 | .. | .. | .. |
| 22:3 | .. | .. | 0·1 | 0·1 | 0·2 | 0·2 | .. | .. |
| 22:4 | .. | 0·1 | .. | .. | .. | 0·6 | 0·1 | .. |
| 22:5 | 0·1 | 0·3 | 0·6 | 0·9 | 0·6 | 1·3 | 3·2 | 3·3 |
| 22:6 | 0·3 | 0·5 | 0·3 | 0·7 | 0·4 | 1·5 | 1·9 | 2·2 |
| 23:0 | .. | .. | .. | .. | .. | .. | 0·1 | 0·5 |
| br-24:0 | .. | .. | .. | .. | .. | .. | 1·9 | 1·9 |
| 24:0 | .. | .. | .. | .. | 0·3 | 0·1 | 3·4 | 6·1 |
| 24:1 | .. | .. | .. | .. | .. | .. | 1·2 | 3·3 |
| 24:2 | .. | .. | .. | .. | .. | .. | .. | 0·2 |

* For each acid, the initial figure gives the chain length. The symbol ":0" denotes saturated; ":1" monounsaturated; ":2" diunsaturated, etc.; "br" denotes branched. See Dole et al. (1959).

## Results

The mean lipid compositions of the four groups of aortas are presented in table I. The relative amounts of different lipids change with the progress of the disease, with cholesterol and its esters rising and the percentage of the other lipid fractions falling. The figures in table I are similar to those previously obtained (Böttcher et al. 1959a, table 2) and statistical comparison of these overall lipid compositions with all those obtained to date (50 in number) showed in fact that the twenty-three aorta preparations analysed were, judged by this criterion, typical examples of the stage of disease to which they had been allotted.

If the lipid fractions are expressed as weight percentages of the dry tissue, the amounts of most of the fractions, including phospholipids and triglycerides, can be seen to increase from stage O to stage III. The only exception is the F.F.A., which on the contrary decrease. This could be an indication of the lower metabolic activity of the diseased wall.

The most striking aspect of the fatty-acid analyses, which are shown in succeeding tables, was the relative constancy of the fatty-acid patterns for each lipid fraction. Individual variations are considerable, and are superimposed on changes in the mean values which can be significantly correlated with the disease; but none of these changes are great enough to distort the characteristic fatty-acid distribution. These distributions are so typical that it is possible to discern by mere inspection of the gas chromatogram from which lipid fraction the fatty-acid mixture under investigation has been derived.

We shall not here present the complete fatty-acid analyses of the 16 groups of lipids (phospholipid, F.F.A.,

TABLE III—CHOLESTEROL ESTERS OF AORTA. MEAN PERCENTAGES OF INDIVIDUAL ACIDS AND COMBINATIONS OF ACIDS FOR FOUR STAGES OF ATHEROSCLEROSIS

| — | Stage of disease | | | | s | P |
|---|---|---|---|---|---|---|
| | O | I | II | III | | |
| No. of samples | 6 | 6 | 6 | 5 | .. | .. |
| % Palmitic (16:0) | 21·5 | 16·0 | 13·7 | 13·2 | 4·2 | 0·01 |
| % Palmitoleic (16:1) | 8·2 | 6·0 | 5·7 | 5·0 | 1·7 | 0·02 |
| % Stearic (18:0) | 5·7 | 3·6 | 1·9 | 1·6 | 1·4 | 0·0004 |
| % Oleic (18:1) | 29·6 | 32·3 | 28·3 | 30·2 | 4·6 | 0·5 |
| % Linoleic (18:2) | 24·5 | 30·0 | 37·0 | 36·0 | 4·8 | 0·0008 |
| % Eicosatrienoic (20:3) | 1·2 | 2·5 | 2·2 | 3·0 | 1·6 | 0·4 |
| % Arachidonic (20:4) | 2·2 | 2·6 | 5·1 | 4·7 | 1·7 | 0·01 |
| % Saturated | 31·2 | 22·9 | 18·7 | 17·0 | 5·4 | 0·002 |
| % Monounsaturated | 39·9 | 39·9 | 35·1 | 36·7 | 5·0 | 0·3 |
| % Polyunsaturated | 28·9 | 37·2 | 46·2 | 46·3 | 5·6 | <0·0001 |

C.E., and glyceride, in stages O, I, II and III); but mean values for undiseased and diseased stages (namely, stages O and II) are shown in table II. Standard deviations are not shown, since these are quoted for the most prominent acids in later tables.

Tables III–VI show the variation of the quantitatively most important acids with stage of disease, for each of the lipid fractions. The second half of each table gives the sums of saturated, monounsaturated, and polyunsaturated acid percentages.

These summations have been made to facilitate examination of the suggestion of various authors (e.g., Sinclair 1956, Luddy et al. 1958) that cholesterol esters of saturated and/or monounsaturated acids tend to be deposited in the arterial wall with the formation of atheroma. If this were true, one would presumably expect to find an ever-increasing proportion of these acids in the artery wall with

TABLE IV—GLYCERIDES OF AORTA. MEAN PERCENTAGES OF INDIVIDUAL ACIDS AND COMBINATIONS OF ACIDS FOR FOUR STAGES OF ATHEROSCLEROSIS

| — | Stage of disease | | | | s | P |
|---|---|---|---|---|---|---|
| | O | I | II | III | | |
| No. of samples | 6 | 6 | 6 | 5 | .. | .. |
| % Myristic (14:0) | 3·5 | 3·6 | 3·4 | 2·8 | 0·8 | 0·5 |
| % Palmitic (16:0) | 25·8 | 25·0 | 21·6 | 23·0 | 3·4 | 0·2 |
| % Palmitoleic (16:1) | 5·4 | 5·3 | 6·1 | 5·2 | 0·9 | 0·3 |
| % Stearic (18:0) | 11·9 | 10·8 | 7·3 | 7·3 | 2·1 | 0·002 |
| % Oleic (18:1) | 32·6 | 33·8 | 40·1 | 35·4 | 4·9 | 0·08 |
| % Linoleic (18:2) | 9·6 | 10·5 | 10·8 | 12·6 | 3·4 | 0·5 |
| % Eicosatrienoic (20:3) | 0·6 | 0·7 | 0·6 | 1·6 | 0·6 | 0·04 |
| % Arachidonic (20:4) | 2·7 | 2·6 | 2·9 | 3·9 | 1·0 | 0·2 |
| % Saturated | 44·9 | 42·8 | 34·7 | 35·3 | 5·7 | 0·01 |
| % Monounsaturated | 40·4 | 41·8 | 48·0 | 43·3 | 4·7 | 0·06 |
| % Polyunsaturated | 14·7 | 15·4 | 17·3 | 21·4 | 5·2 | 0·2 |

increasing severity of the lesions. One observes, on the contrary (table III), a marked increase in the polyunsaturated acids, coupled with a decrease in all saturated acids. Both these changes are statistically highly significant.

According to Sinclair (1959), cholesterol esters of "abnormal" polyunsaturated acids—i.e., with double bonds in different positions from those in the essential fatty acids (E.F.A.) or with the *trans-* instead of the *cis-*configuration, are also likely to be found in atheroma. Such acids could have the same gas-chromatographic characteristics as the true E.F.A., and therefore be mistaken for them. For this reason the major polyunsaturated acid of the cholesterol esters, 18 : 2, was examined further to see whether it was identical with linoleic acid or not.

Several stage-II aorta preparations were pooled, and the cholesterol-ester fatty acids (C.E.F.A.) isolated. Preparative gas chromatography on Apiezon yielded 20 mg. of the methyl ester of 18 : 2 contaminated with some 18 : 1. Ozonolysis, oxidation, and methylation yielded azelaic ($C_9$ dibasic) and caproic ($C_6$) acids, with less than 9% of other acids (discounting pelargonic acid, from the oleic acid). Infra-red spectroscopic analysis (kindly carried out by Unilever Research Laboratory, Vlaardingen) gave a maximum of 2% *trans*-double bonds.

The conclusion is inescapable that the acid measured as 18 : 2, which comprises almost all of the dienoic acids and forms the major component of the polyunsaturated acids, is in fact at least 90% true linoleic acid (cis, cis-9, 12-octadecadienoic acid).

The structure of the other polyunsaturated acids detected (which include, approximately in descending order of magnitude, 20 : 4, 20 : 3, 20 : 5, 20 : 2, 22 : 5 and 22 : 6) has not yet been so firmly established. However, it can be seen from the tables that the percentage of each of

TABLE V—FREE FATTY ACIDS OF AORTA. MEAN PERCENTAGES OF INDIVIDUAL ACIDS AND COMBINATIONS OF ACIDS FOR FOUR STAGES OF ATHEROSCLEROSIS

| — | Stage of disease | | | | s | P |
|---|---|---|---|---|---|---|
| | O | I | II | III | | |
| No. of samples | 6 | 6 | 5 | 5 | .. | .. |
| % Palmitic (16:0) | 21·1 | 19·1 | 17·7 | 18·0 | 4·0 | 0·5 |
| % Palmitoleic (16:1) | 3·4 | 3·3 | 3·5 | 4·3 | 1·5 | 0·6 |
| % Stearic (18:0) | 18·0 | 16·8 | 16·2 | 14·2 | 4·3 | 0·5 |
| % Oleic (18:1) | 23·7 | 22·3 | 23·1 | 23·3 | 4·1 | 0·9 |
| % Linoleic (18:2) | 17·6 | 18·7 | 15·7 | 19·2 | 6·2 | 0·8 |
| % Eicosatrienoic (20:3) | 0·7 | 1·1 | 1·6 | 1·9 | 0·9 | 0·2 |
| % Arachidonic (20:4) | 5·5 | 8·0 | 12·1 | 9·5 | 4·9 | 0·2 |
| % Saturated | 44·9 | 41·5 | 37·9 | 36·9 | 8·2 | 0·4 |
| % Monounsaturated | 28·6 | 27·1 | 28·0 | 29·3 | 4·6 | 0·9 |
| % Polyunsaturated | 26·5 | 31·4 | 34·1 | 33·8 | 8·9 | 0·5 |

these individual acids changes with the stage of the disease in the same sense as that of linoleic, so that the polyunsaturated acids can, at any rate in the present study, be regarded as a homogeneous group.

It is worth noting that almost the whole of the trienoic acid in aorta consists of 20 : 3, and that linolenic acid, assumed by other workers to be the main trienoic acid constituent, contributes to the total in only trace amounts.

The analysis of variance of the figures in tables I and III–VI showed that differences between stages O and I or between stages II and III were of low or negligible significance; where a high level of significance is shown, it refers to the difference between O or I on the one hand and II or III on the other.

The changes in *glyceride* fatty acids (table IV) are similar to those in cholesterol esters, with a fall in saturated acids balancing a rise in polyunsaturated acids. These changes are, however, much less significant than in the cholesterol esters. An "out-

TABLE VI—PHOSPHOLIPIDS OF AORTA. MEAN PERCENTAGES OF INDIVIDUAL ACIDS AND COMBINATIONS OF ACIDS FOR FOUR STAGES OF ATHEROSCLEROSIS

| — | Stage of disease | | | | s | P |
|---|---|---|---|---|---|---|
| | O | I | II | III | | |
| No. of samples | 5 | 4 | 5 | 5 | .. | .. |
| % Palmitic (16:0) | 24·8 | 28·1 | 29·7 | 29·9 | 2·6 | 0·03 |
| % Palmitoleic (16:1) | 1·4 | 0·8 | 0·9 | 1·1 | 0·4 | 0·2 |
| % Stearic (18:0) | 20·0 | 18·6 | 14·8 | 15·1 | 2·3 | 0·005 |
| % Oleic (18:1) | 14·7 | 11·4 | 9·8 | 9·7 | 2·7 | 0·04 |
| % Linoleic (18:2) | 5·0 | 4·4 | 3·9 | 4·2 | 2·0 | 0·8 |
| % Eicosatrienoic (20:3) | 2·1 | 1·6 | 1·7 | 1·8 | 0·6 | 0·5 |
| % Arachidonic (20:4) | 9·9 | 10·1 | 9·4 | 7·4 | 2·5 | 0·3 |
| % Behenic (22:0) | 1·6 | 3·4 | 4·5 | 4·4 | 1·1 | 0·003 |
| % Lignoceric (24:0) | 3·4 | 3·8 | 6·1 | 6·4 | 2·3 | 0·15 |
| % Tetracosenoic (24:1) | 1·2 | 1·5 | 3·3 | 4·7 | 2·0 | 0·06 |
| % Saturated | 55·2 | 59·4 | 61·2 | 62·0 | 5·0 | 0·2 |
| % Monounsaturated | 19·4 | 15·6 | 16·6 | 16·6 | 3·3 | 0·3 |
| % Polyunsaturated | 25·4 | 25·0 | 22·2 | 21·4 | 3·7 | 0·3 |

of-line" result is the sudden rise in monounsaturated acids between stages I and II, whereas the value for stage III is not significantly different from that in stage I. The relative prominence of myristic acid, always between 3 and 4%, for glyceride fatty acids is interesting: for other lipid fractions this percentage is 1 to 2, in phospholipids less than 1.

Table V shows trends in mean values in the *free fatty acids* which are similar to those in C.E. and glyceride, but which are in no case statistically significant.

Although these three fractions show similar changes, one figure is especially characteristic of the C.E.F.A.—namely, the ratio of linoleic to stearic acid. For glyceride and F.F.A., this ratio is low and increases very slightly from stage O to stage III (1·0 to 1·9), whereas for C.E. it is high, and increases several-fold (stage O, 4·7; I, 19·2; II, 21·1; III, 24·2). The ratio changes so dramatically that it can almost be regarded as an index of the degree of atherosclerosis in the aortic wall (Böttcher 1960).

The *phospholipids* present a quite different picture (table VI). Phospholipid fatty acids are characterised by a high degree of saturation, and this actually increases (though slightly) with the severity of the lesions. This is the resultant of a decreasing stearic-acid content coupled with increases of palmitic acid and of two new acids of consequence—$C_{22}$ and $C_{24}$ saturated. The initial fall and subsequent rise of the monounsaturated total is largely due to the opposing trends of oleic acid and a third typical "phospholipid" acid, $C_{24}$ monoenoic. The polyenoic acids show a decrease from stage O to stage III, a decrease in which linoelic acid plays only a small and irregular part.

These irregular variations in individual acids, and the contrary behaviour of different acids of the same degree of unsaturation (e.g., palmitic and stearic, oleic and 22 : 1), are in contrast with the smooth and consistent changes with disease shown in the other lipids. The phospholipids differ from the other lipid fractions in being a mixture, consisting of at least four major classes of compound (cephalins, lecithins, sphingomyelins, lysolecithins). The irregularly changing fatty-acid compositions mainly reflect changes in the ratios of these four classes, each having its characteristic fatty-acid pattern, rather than variations in the fatty-acid make-up of any phospholipid class. We have established that, in common with sphingomyelins from other sources, artery sphingomyelins contain an unusually high proportion of $C_{24}$ acids, a small percentage of oleic acid, and virtually no polyunsaturated acids. We have also found, in agreement with Buck and Rossiter (1951) and Smith (1959), that the ratio of sphingomyelins to other phospholipids increases with the stage of the disease. These facts account for most of the changes found in the total phospholipid fatty acids. Details of the phospholipid analyses will be published later.

## Discussion

### *Aorta Cholesterol Esters*

In examining fatty-acid compositions, most other workers have confined themselves to those of the cholesterol esters, and their figures may be compared with the relevant portion of our results. Recently, Wright, Pitt, and Morton (1959) published figures which they pointed out to be in disagreement with those of other authors working on cholesterol esters from atheromatous aortic tissue, though in moderate agreement with our previous, incomplete results.

It is evident from table VII that our newer results are in fair, but only fair, agreement with those of Wright et al., the important differences being that we find higher dienoic and lower saturated-acid percentages for stages II and III than they do in plaques. The agreement is closer than previously, in particular in that our newer methods have led to the observation of a lower figure for monoenoic acids. The remaining differences could be due to either or both of two factors: (1) differences in extraction technique, in that grinding of the tissue under ether according to Wright et al. might conceivably lead to oxidation and loss of dienoic acid; or (2) differences in the estimation method. At first sight gas chromatography seems preferable to the alkali isomerisation used by Wright et al. in that the individual acids can be recognised and separately estimated; though as a technique it is also not without its difficulties. It is perhaps significant that our results are most nearly in accord with those of Tuna et al. (1958), who employed gas chromatography for the determination of the percentages of saturated and monounsaturated acids.

TABLE VII—CHOLESTEROL-ESTER FATTY ACIDS IN ATHEROMATOUS AORTAS

| — | Present authors | | | | Wright et al. (1959) Plaques and walls | Tuna et al. (1958) Plaques | Luddy et al. (1958) Plaques |
|---|---|---|---|---|---|---|---|
| | Stage O | Stage I | Stage II | Stage III | | | |
| % Saturated | 31·2 | 22·9 | 18·7 | 16·1 | 26·1 | 10·7 | 4·2 |
| % Monoenoic | 39·9 | 39·9 | 35·1 | 37·5 | 35·1 | 41·3 | 61·5 |
| % Dienoic | 24·6 | 30·8 | 37·3 | 37·2 | 29·5 | 37·6 | 23·6 |
| % Trienoic | 1·6 | 2·8 | 2·8 | 3·4 | 3·0 | 1·6 | 1·4 |
| % Tetraenoic | 2·1 | 2·7 | 5·3 | 4·6 | 4·7 | 7·4 | 7·0 |
| % Pentaenoic | 0·3 | 0·6 | 0·3 | 0·8 | 1·0 | 0·9 | 1·3 |
| % Hexaenoic | 0·3 | 0·3 | 0·5 | 0·4 | 0·5 | 1·0 | 1·0 |

In any case, it is clear that the results of Luddy et al. (1958) differ widely from all others given. Their value of 61·5% for monoenoic acids, which was obtained by difference, is 15% higher than the highest value we have ever found by direct measurement and addition. Similarly, the lowest percentage of saturated acids we have observed in any individual case is 11·2, compared with their 4·2.

The main interest of our results lies in the examination of aortas in three stages of atherosclerosis, compared with apparently uncl[illegible]eased aorta. The C.E. show, in opposition to what is predicted by the E.F.A. hypothesis, increases in linoleic and all polyunsaturated acids. Saturated cholesterol esters, far from being preferentially deposited, decrease sharply in percentage from undiseased to diseased aortas. These changes in fatty-acid composition are the most striking to be seen in any of the lipid fractions, and are statistically highly significant.

### *Comparison with Plasma Cholesterol Esters*

One of the main theories of atherogenesis postulates that the lipids found in arterial deposits originate in the blood. Some light can be thrown on whether this is so, and if so whether the deposition is indiscriminate or selective, by comparing the fatty-acid compositions of the deposited lipids with those found in plasma. The determinations of unsaturated acids in plasma-cholesterol esters by different authors are, in contrast with those in atheromas, in moderate agreement with one another (table VIII).

The mean values for dienoic acids lie between 35 and 50%. Our figures (table VII) for C.E. dienoic acids in stages II and III coincide with the lower end of this range (cf. those for the plasma of atherosclerotic patients), and the values for the other polyunsaturated and for the satu-

TABLE VIII—CHOLESTEROL-ESTER FATTY ACIDS IN PLASMA FROM NORMAL AND ATHEROSCLEROTIC SUBJECTS

| — | Wright et al. (1959) Normal | Luddy et al. (1958) Normal | Tuna et al. (1958) Normal | Schrade et al. (1959) | | |
|---|---|---|---|---|---|---|
| | | | | Normal | Atherosclerotic | Diabetic |
| % Saturated | 11·9±3·9 | 18·7 | 16·2 | .. | .. | .. |
| % Monoenoic | 32·7±6·9 | 23·5 | 28·6 | .. | .. | .. |
| % Dienoic | 43·8±3·5 | 47·5 | 41·1 | 47·1±1·2 | 38·0±1·1 | 37·7±1·2 |
| % Trienoic | 4·0±0·8 | 0·7 | 0·7 | 0·8±0·06 | 1·5±0·09 | 1·6±0·11 |
| % Tetraenoic | 6·1±1·5 | 8 0 | 6·2 | 6·3±0·2 | 5·0±0·2 | 4·4±0·2 |
| % Pentaenoic | 0·8±0·3 | 0·9 | 0·7 | .. | .. | .. |
| % Hexaenoic | 0·7±0·4 | 0·7 | 1·2 | .. | .. | .. |

rated C.E.F.A. are also not significantly different from those in plasma. A weak case could be made out for a preferential deposition of monoenoic acids, but there is nowhere an indication of marked specificity in the kind of acid deposited. On the contrary, the impression is that the aortic C.E. are deposited from plasma in an indiscriminate non-specific way which results in the C.E.F.A. in the arterial wall having the same composition as in plasma. Furthermore, the animal organism is generally supposed not to be able to synthesise linoleic acid (though see James et al. 1959); so the fact that the percentage of C.E. linoleic acid is as high in the deposits as in plasma implies that the whole of the C.E. derive from the blood and are not to any appreciable extent diluted with C.E. synthesised in the aortic wall.

*Comparison of Glycerides, Free Fatty Acids, and Phospholipids of Aorta and Plasma*

A similar comparison of fatty-acid compositions of glyceride, F.F.A., and phospholipid fractions of blood and aorta lipids is instructive. The analyses of plasma lipids by Schrade et al. (1959) are based on methods similar to our own, except for the final estimation, which used an alkali isomerisation method. Unfortunately, saturated and monoenoic acids were not determined by these authors, so that complete comparison is impossible. However, enough data are available to show (table IX) that the values

TABLE IX—FATTY ACID COMPONENTS OF GLYCERIDES, FREE FATTY ACIDS AND PHOSPHOLIPIDS IN AORTA AND PLASMA

| — | Present authors: intima and media | | | | Schrade et al. (1959): plasma | | |
|---|---|---|---|---|---|---|---|
| | Stage O | Stage I | Stage II | Stage III | Normal | Athero-sclerotic | Diabetic |
| Glycerides | | | | | | | |
| % Dienoic | 10·0 | 10·8 | 11·4 | 13·4 | 11·2 | 10·9 | 10·8 |
| % Trienoic | 0·8 | 1·0 | 1·1 | 1·8 | 0·9 | 0·7 | 0·7 |
| % Tetraenoic | 2·7 | 2·8 | 2·9 | 3·9 | 1·5 | 0·8 | 0·7 |
| Free fatty acids | | | | | | | |
| % Dienoic | 18·1 | 18·8 | 15·9 | 19·7 | 4·0 | 2·9 | 3·1 |
| Phospholipids | | | | | | | |
| % Dienoic | 6·1 | 6·0 | 4·5 | 6·4 | 22·2 | 19·6 | 19·8 |
| % Trienoic | 2·1 | 1·8 | 1·7 | 1·8 | 0·7 | 1·2 | 1·3 |
| % Tetraenoic | 10·0 | 11·0 | 9·4 | 8·1 | 6·6 | 4·5 | 4·6 |

for glyceride acids in aorta and plasma resemble one another, but that the dienoic-acid contents of F.F.A. and phospholipid are extremely dissimilar.

A closer comparison is possible with the results of Dole et al. (1959) on plasma lipids, since these authors determined fatty-acid composition by gas chromatography. As they did not separate the C.E. from the glyceride fraction, only the F.F.A. and phospholipid fractions can be compared (table X). For the F.F.A. there is in this case no great difference between aorta and plasma lipids: the patterns are similar, with the reservation that in the aortic wall the percentage of oleic acid is lower, that of polyunsaturated acids somewhat higher. The discrepancy between the results of Dole et al. and those of Schrade et al. could be due to the use by the latter of ion-exchange resins for extraction of the F.F.A.: in our experience, the use of these resins leads to degradation.

The difference between aorta and plasma phospholipid is, however, confirmed: the lower percentages of oleic and linoleic acids found in the deposits are striking. The figure of 14% for phospholipid linoleic acid has also been obtained in this laboratory in the two preliminary analyses of plasma lipids so far completed; so the difference between aorta and plasma phospholipid is not a question of differ-

TABLE X—COMPARISON OF INDIVIDUAL ACID PERCENTAGES IN FREE FATTY ACIDS AND PHOSPHOLIPIDS OF AORTA AND PLASMA

| — | Free fatty acids | | | Phospholipids | | |
|---|---|---|---|---|---|---|
| | Intima and media | | Plasma (Dole et al. 1959) | Intima and media | | Plasma (Dole et al. 1959) |
| | Stage O | Stage III | | Stage O | Stage III | |
| % Palmitic .. .. | 21·1 | 18·0 | 23·2 | 24·8 | 29·9 | 33·1 |
| % Palmitoleic .. .. | 3·4 | 4·3 | 2·4 | 1·4 | 1·1 | 2·5 |
| % Stearic .. .. | 18·0 | 14·2 | 12·9 | 20·0 | 15·1 | 12·8 |
| % Oleic .. .. | 23·7 | 23·3 | 32·6 | 14·7 | 9·7 | 18·6 |
| % Linoleic .. .. | 17·6 | 19·2 | 14·3 | 5·0 | 4·2 | 16·0 |
| % Eicosatrienoic .. | 0·7 | 1·9 | 1·3 | 2·1 | 1·8 | 1·8 |
| % Arachidonic .. .. | 5·4 | 9·5 | 4·7 | 9·9 | 7·4 | 4·3 |

ing laboratory techniques. Two possible explanations of this phenomenon are that one of the phosphatides of blood preferentially accumulates in atheromas, as discussed above; or that the phospholipid of aorta are synthesised in situ and do not originate in plasma at all. The work of Zilversmit and McCandless (1959) shows that the aortic wall is an active site for phospholipid synthesis, at least in the rabbit.

Still more detailed analyses of aorta and blood lipids are needed to distinguish between these possibilities, and these are already in progress.

*Lipids of Other Arteries*

The overall composition of lipids from coronary arteries differs considerably from that of aorta lipids (Böttcher et al. 1959a). We have been investigating whether the changes in the fatty-acid compositions of lipid fractions with aortic atherosclerosis are to be found in comparing undiseased and atherosclerotic coronary arteries and with similar arteries from the circle of Willis. This programme has suffered some delay because of the difficulty of obtaining sufficient quantities of lipid from the undiseased tissues, but the results will be reported in due course. There do seem to be some differences in the observed fatty-acid compositions—for example a higher oleic-acid percentage in the triglycerides of atherosclerotic coronary arteries than in the corresponding fraction from aorta.

**Summary**

The analysis of lipids from preparations of intima and media from young undiseased aortas and from aortas in three stages of atherosclerosis is described. The lipids were separated into phospholipids, free fatty acids (F.F.A.), cholesterol esters (C.E.), and glycerides plus free sterols, and the fatty acids obtained from these four fractions were analysed by gas chromatography.

The most striking changes were observed in the cholesterol-ester fatty acids (C.E.F.A.), in which with increasing atherosclerosis of the artery the polyunsaturated acid percentage rises from 29 to 46% and the saturated acids decrease from 31 to 17%, while the monounsaturated acids show no significant change. It was established that the main component of the C.E. polyunsaturated acids, octadecadienoic acid, is linoleic acid and not an isomer of it.

Similar, but smaller changes were found in the F.F.A. and glyceride fatty acids. Phospholipid changes are different and more variable, and probably reflect changes in the ratio of the different phosphatides to one another.

The bearing of these results on current theories of atherogenesis is discussed.

Preliminary findings on the lipids of coronary arteries and brain arteries are mentioned.

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# PULMONARY ALVEOLAR PROTEINOSIS

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IN 1958 Rosen, Castleman, and Liebow summarised 27 cases of an apparently new entity to which they gave the name of "pulmonary alveolar proteinosis". This name was based on the histological appearances, which are characterised by a peculiar alveolar consolidation of protein-like material with a surprising absence of inflammatory infiltration. The majority of their cases were adults aged 20 to 50, with a male preponderance of 2·5 : 1. The predominating symptom is progressive dyspnœa, usually insidious in onset, although sometimes preceded by one or more febrile illnesses often thought to be pneumonic. Once the illness is established, fever is not a feature. Other common symptoms are cough (usually productive but occasionally blood-stained), fatigue, chest pain, and slight loss of weight. Rosen et al. describe the X-ray appearances as fine, diffuse, perihilar radiating shadows, feathery or vaguely nodular, resembling in their "butterfly" distribution the pattern seen in severe pulmonary œdema. The clue to the diagnosis, they say, is that the symptoms are inappropriate to the gross radiological changes. The diagnosis can be firmly established only by lung biopsy.

The 27 cases of Rosen et al. had been collected over five years, 24 coming from scattered parts of the United States and 1 each from England, Canada, and Italy. Since then four reports from America (Friedman and Strickland 1958, Lull et al. 1959, Landis et al. 1959, Moertel et al. 1959) together add another 5 cases, and a 6th has been recorded in New Zealand (McDowell et al. 1959). All these reports substantiate the main features of the original large series. The case here reported also follows the same general pattern. Rosen and his colleagues noted that cases seemed to be coming to their notice with increasing frequency, and more general recognition of the disease may perhaps reveal that it is also not a rarity in Great Britain.

## Case-report

A man, aged 35 in 1958, had been a coal-miner since he was 14, and had also worked part-time on a farm since the summer of 1957. From the beginning of 1958 he had occasional chest pains and was sometimes short of breath at work, but he did not seek medical advice. In June, 1958, when mass radiography was carried out at the pit, his chest was regarded as clear; and this was reaffirmed when the film was checked in the light of later developments. In July he was treated with antibiotics at home for what appeared to be right-sided pneumonia. During this episode, although never afterwards, he had slightly bloodstained sputum. He returned to work; but he did not feel well, becoming increasingly breathless on exertion, and had to stop work again after two weeks. He had a troublesome cough, mainly dry but productive of grey sputum in the mornings. Night-sweats occurred and he lost 14 lb. in weight in two months.

*Progress of Illness*

When he was admitted to the Nottingham City Hospital on Sept. 14, 1958, his temperature was 99·8°F; but it fell the same day and never rose above 99°F during his three weeks' stay. The only physical sign was slightly diminished air entry, with impaired percussion note, at the left base. Radiography showed shadows in the left mid-zone and right base, consisting of multiple minute opacities (fig. 1). The white-cell count was 8700 per c.mm. with 78% neutrophils. Friedländer's bacillus was cultured from the sputum but no tubercle bacilli were found or grown either then or subsequently. He was treated with penicillin at first, and then with streptomycin. There was slight clearing of the X-ray film but some diffuse shadowing persisted. He was discharged on Oct. 8 with a diagnosis of atypical pneumonia.

During the next six months he was admitted to hospital three times. The first two readmissions were prompted by recurrence of cough and pain in the chest, although throughout

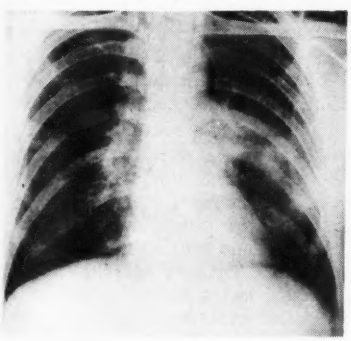

Fig. 1.

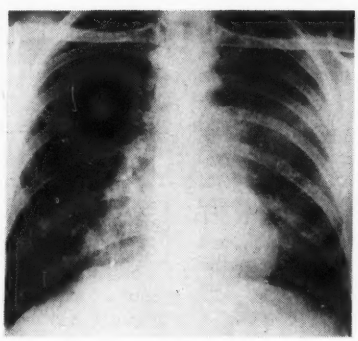

Fig. 2.

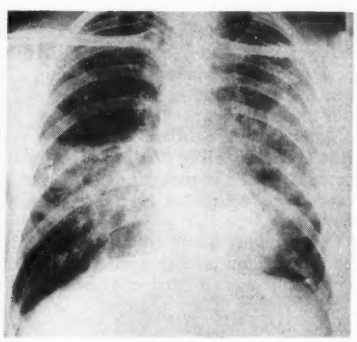

Fig. 3.

**Figs. 1 to 3—X-ray appearances: (1) on admission to hospital in September, 1958; (2) at the time of lung biopsy in April, 1959; (3) in July, 1959, after return home.**

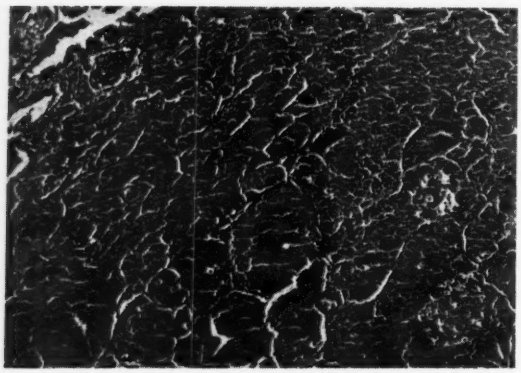

Fig. 4—Lung biopsy. Diffuse consolidation with finely granular "proteinaceous" material. (Hæmatoxylin and eosin. ×33.)

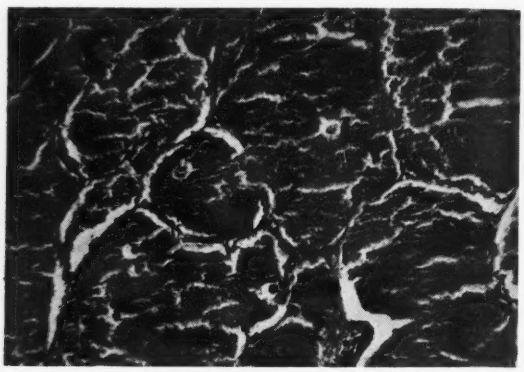

Fig. 5—Lung biopsy. Higher-power view of several alveoli to show absence of inflammatory infiltration. Only a very occasional large mononuclear cell is seen. (H. & E. ×100.)

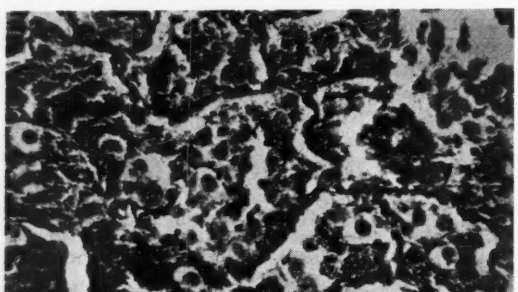

Fig. 6—Lung biopsy. A group of alveoli containing numerous large mononuclear cells ("septal cells"). The "proteinaceous" material, staining darkly with P.A.S., is more sparse here. It is seen most prominently towards the lower left-hand corner where the mononuclear cells are fewer. (P.A.S. ×225.)

the illness increasing dyspnœa on exertion was the predominant symptom. Radiological examinations, in spite of minor fluctuations, showed gradually extending opacities, almost fluffy in type, involving both the lungs, but especially the left, and maximal in the perihilar regions (figs. 1–3).

When he was admitted for the third time, in January, 1959, further investigations were undertaken with a view to excluding polyarteritis nodosa and sarcoidosis. There was little support for the former diagnosis, pyrexia being insignificant, eosinophilia absent, and muscle biopsy negative. From the X-ray appearances, sarcoidosis seemed a more likely possibility although enlargement of the hilar lymph-nodes was not detected. However, biopsy of the scalene lymph-node was negative, and, whereas the Mantoux tuberculin test was negative at a dilution of 1/1000, it was positive at 1/100. It was at this stage that lung biopsy was proposed to establish a diagnosis, but the patient's response to premedication was such that it seemed likely that a general anæsthetic might be dangerous. This was thought to be due to recent treatment with prednisone, which had been discontinued because it appeared ineffective.

Lung biopsy was therefore postponed for two months, and he was readmitted on April 7, 1959. At this time, he was symptomless apart from exertional dyspnœa; chest signs were negligible but X-ray changes were extensive (fig. 2). A left thoracotomy was performed on April 28. The lung felt generally granular, with firmer areas in the lingula and posterior upper zone. The tip of the lingula was amputated. The fluid which exuded from the cut surface resembled pus; but microscopically pus cells were absent, no organisms were detected, and cultures were sterile.

*Histology of Lung*

There were extensive areas of confluent consolidation of unusual type. The alveoli were distended with finely granular eosinophilic material (fig. 4). Inflammatory infiltration was absent (fig. 5), but there were infrequent large foamy mononuclear cells (the "septal cells" of Rosen et al.), mostly collected within scattered small groups of alveoli (fig. 6). The eosinophilic material gave a strongly positive periodic-acid/Schiff (P.A.S.) reaction, and frozen sections stained with Sudan and oil red dyes showed fairly diffuse fine deposition of lipoid, with increased amounts in the mononuclear cells, whose cytoplasm stained with P.A.S. Stains appropriate for bacteria, fungi, and pneumocystis were negative. These included Gomori's methenanamine/silver-nitrate method (Grocott 1955), which has been found especially suitable for pneumocystis. All these histological findings were typical of pulmonary alveolar proteinosis.

*Further Course*

The patient has not been able to return to work and his activities are considerably restricted by breathlessness. Last July the X-ray changes had increased (fig. 3) and the films taken in October show no improvement.

## Discussion

The present case illustrates most of the features of pulmonary alveolar proteinosis and gives some indication of the commoner diagnoses which are likely to be considered. Of these, sarcoidosis causes the most confusion and has figured as a provisional diagnosis in many of the reported cases. The radiological appearances have some similarities, the main features distinguishing pulmonary alveolar proteinosis from sarcoid being the predominance of perihilar shadows, the irregular distribution elsewhere, and (most characteristic of all) the absence of hilar lymph-node enlargement.

Two other diagnoses require brief mention in this case. The patient having been a coalminer for twenty years, pneumoconiosis was obviously thought of, but the X-ray changes were not consistent with this. Another occupation which could have had some bearing was part-time employment on a farm, and "farmer's lung" therefore required exclusion, especially as the patient thought that dyspnœa was more noticeable while working on the farm than in the mine. "Farmer's lung" seems to be related to the inhalation of dusts from mouldy hay or corn crops (Dickie and Rankin 1958). There had, in fact, been no

exposure to mouldy crops, and, without going into details here of the clinical and radiological differences, " farmer's lung " has a totally different histology, consisting of a granulomatous (sometimes tuberculoid) interstitial infiltration.

The histology of pulmonary alveolar proteinosis bears resemblance to only one other condition—namely, pneumocystis infection. However, pneumocystis pneumonia, generally regarded as synonymous with interstitial plasma-cell pneumonia (Gajdusek 1957), is a disease of young infants: the organism *Pneumocystis carinii*, which is held responsible for it has been found only in a few instances in adults (Hamperl 1956) and these appear to have been secondary infections. Rosen et al. noted certain similarities between the pathological appearances of pneumocystis pneumonia and pulmonary alveolar proteinosis; but they described distinguishing features and they could not find the pneumocystis parasite in their cases. Moreover, Hamperl saw the sections of 2 of their cases in 1955 and agreed that it appeared to be a different entity.

Other possible ætiological factors can be put forward only very tentatively. Rosen et al. discuss in general terms the possibility that some relatively recently introduced inhalant, perhaps of a chemical nature, might be responsible. They note also that 4 of their patients worked in or about lumberyards and one was a carpenter. The patient of Moertel et al.'s report had formerly been a lumberyard worker and carpentry was his hobby. Rosen et al. do not indicate how this rather broad occupation group could be linked with pulmonary alveolar proteinosis and whether or not inhalation of wood dust could be held responsible. Our patient's work did not especially bring him in contact with wood or wood dust. Apart from this group, the recorded occupations have been widely scattered and no other miner appears among the cases reviewed.

The prognosis of pulmonary alveolar proteinosis is difficult to assess as yet. Rosen et al. said that 8 of their patients had died, while in 13 the symptoms had persisted, with varying intensity, for periods between five and thirty-five months. Only 1 patient had apparently fully recovered, although 4 more were definitely improved at the time of their publication. Another of Rosen's cases has since proved fatal (personal communication from Plenk, cited by Lull et al. 1959). The patient of McDowell et al.'s report had much improved and was almost clear radiologically fifteen months after lung biopsy. Authors of other recent reports have not followed up their cases sufficiently long to provide any useful prognostic data; but I know of no other fatal cases.

Rosen et al. did not feel that treatment with adrenocorticoids or various antibiotics affected the course of the disease, although antibiotics appeared to be useful in terminating febrile episodes. This seemed to be equally true in the present case. Moertel et al. thought that prednisone was responsible for clinical improvement in their single case but it did not prevent X-ray recurrence three months later. The patient of McDowell et al. who showed sustained improvement both clinically and radiologically, had been treated with potassium iodide in large doses because, on clinical grounds, the disease was tentatively attributed to a fungus infection. Though the improvement may have been purely fortuitous, potassium iodide might be worth another trial.

Pulmonary alveolar proteinosis thus presents many problems, some of which may be solved by the detection of more cases and a detailed evaluation of the occupational and other possible ætiological factors. Diagnosis can be established with certainty only by lung biopsy—a procedure which would be regarded by many as a rather drastic form of investigation in what may at first appear to be a relatively mild complaint. As, however, the eventual prognosis is probably decidedly bad, subjection to lung biopsy is fully justifiable in cases with the clinical and radiological findings described.

I wish to express my thanks to Dr. S. B. Benton, the physician in charge of the case; Mr. J. S. A. Linton, thoracic surgeon; Dr. C. H. Wood, radiologist; and Dr. J. M. Forrester, general practitioner, all of whom have been most cooperative in allowing me to make use of their records. I am indebted to Mr. E. S. McLeod for the photographs.

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### Addendum

The patient died in Sheffield Royal Hospital on April 25. The postmortem studies have not yet been completed, but I am indebted to Dr. L. Wolman, who performed the examination, for the preliminary information that death was due to multiple metastatic cerebral abscesses secondary to infection in relation to the pulmonary alveolar proteinosis. Up to the time when cerebral symptoms developed there had been no significant clinical or radiological change in the patient's pulmonary state.

## PULMONARY ALVEOLAR PROTEINOSIS

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PULMONARY alveolar proteinosis was first described by Rosen et al. (1958), who collected 27 cases from various sources over five years. Since then 9 further cases have been reported, 8 of them from America (Friedman and Strickland 1958, Lull et al. 1959, McDowell et al. 1959, Moertel et al. 1959, Sieracki et al. 1959, Carlson and Mason 1960). 2 of the original cases have been described in greater detail (Carabasi and Barta 1959, Payseur et al. 1958). Although clinical and pathological studies have been very full, the cause and appropriate treatment are still unknown. In view of the diagnostic difficulties, we record the following case.

### Case-report

A man, aged 21, had worked as a grocery-shop assistant, gardener, and wool packer. He had had severe acne and seborrhœa since puberty, and was treated with superficial X-rays and ultraviolet light with moderate improvement. At the age of 16 he developed progressive lymphœdema of his right leg and genitalia, and in June, 1957, the preputial œdema necessitated circumcision. At this time his hæmoglobin was 93%. In the early part of 1958 aplastic anæmia was

discovered and he was referred to Dr. J. F. Wilkinson in the hæmatology department of the Manchester Royal Infirmary.

The patient was a pale youth, apyrexial but ill-looking, with severe cicatrising acne on his face, neck, and shoulders. The right leg and thigh, and the genitalia were grossly œdematous, and his left foot showed slight œdema. In the left scrotoperineal fold was a superficial sinus discharging serosanguineous fluid, which had appeared two months previously. The lymph-nodes were not enlarged. The blood-pressure, cardiovascular system, and chest were normal.

*Investigations.*—Hæmoglobin 7·6 g. per 100 ml.; red-cell count 2,482,000 per c.mm.; colour-index 1·02; white-cell count 3200 per c.mm. (polymorphs 65%, lymphocytes 28%, monocytes 2%, eosinophils 3%, and basophils 2%); platelet-count 65,000 per c.mm.; reticulocytes less than 1%. Sternal marrow was hypoplastic with no abnormal cells (Dr. M. C. G. Israëls). Coombs test negative. Blood Wassermann and Kahn reactions: negative. Mantoux test at 1/100: negative. Serum-albumin 3·5 g. per 100 ml.; serum-globulin 2·7 g. per 100 ml.; serum-bilirubin 0·4 mg. per 100 ml.; thymol-turbidity 1 unit; alkaline phosphatase 9·0 King-Armstrong units per 100 ml.; blood-urea 24 mg. per 100 ml. Culture of discharge from sinus: sterile. Chest radiograph normal. Radiographs of pelvic bones and of soft tissues of right thigh normal.

*Diagnosis and Treatment*

The diagnosis was clearly aplastic anæmia. The ætiology was uncertain as he had no history of exposure to marrow-depressing drugs, and the total dose of X-radiation, given five years before, seemed too small to be responsible. He was treated with prednisolone 60 mg. daily and concentrated red-cell transfusions. He improved considerably, and was discharged to the outpatient clinic. For the following nine months he remained well on 15 mg. of prednisolone daily, and a transfusion of 1 pint of concentrated red cells every three weeks.

*Readmissions to Hospital*

In July, 1959, he developed pyrexia, without localising symptoms. The fever settled after four days, but recurred three days later with rigors. He was given tetracycline, but did not improve. Two weeks later he had spasms of sharp pain in the left side of his chest. He had no cough. On admission to hospital, the only changes on examination were the pyrexia of 101°F, and the healing of the perineal sinus.

*Investigations.*—Hæmoglobin 10·7 g. per 100 ml.; white-cell count 8200 per c.mm. (polymorphs 60·5%, lymphocytes 8%, monocytes 1%, eosinophils 20%, and basophils 10·5%); platelets 140,000 per c.mm. Serum-albumin 3·3 g. per 100 ml.; serum-globulin 3·1 g. per 100 ml.; serum-bilirubin 0·5 mg. per 100 ml.; thymol-turbidity 3·8 units; alkaline phosphatase 6 K.A. units per 100 ml. Blood, urine, and sputum cultures sterile. Widal agglutination tests negative. Chest radiograph normal (fig. 1).

Next day the patient's temperature returned to normal and he felt well. He was discharged from hospital, but he had several short febrile episodes, and he required more frequent transfusions to maintain his hæmoglobin. During September he had increasing exertional dyspnœa, and right-sided pleuritic pain and pyrexia developed. He was readmitted in October.

He was then dyspnœic at rest, and his temperature was 102·6°F. There were crepitations at both lung bases, but no pleural friction rub could be heard.

*Investigations.*—Hæmoglobin 7·6 g. per 100 ml.; red-cell count 3,283,000 per c.mm.; colour-index 0·75; white-cell count 6400 per c.mm. (polymorphs 49%, lymphocytes 8%, monocytes 2%, eosinophils 35%, and basophils 6%); platelets 94,000 per c.mm. Sternal-marrow biopsy showed an active normal marrow (Dr. Israëls). Serum-sodium 135 mEq. per litre; potassium 4·4 mEq. per litre; chloride 92 mEq. per litre; calcium 9·8 mg. per 100 ml.; inorganic phosphate 3·75 mg. per 100 ml. Serum-albumin 2·7 g. per 100 ml.; serum-globulin 2·9 g. per 100 ml.; serum-bilirubin 0·4 mg. per 100 ml.; thymol-turbidity 2·8 units; alkaline phosphatase 8 K.-A. units per 100 ml.; blood-urea 27 mg. per 100 ml. Lupus-erythematosus cells not present; Widal reaction negative; brucella agglutinations negative; blood and urine cultures negative. Sputum-culture yielded a few colonies of a hæmolytic streptococcus, *Staphylococcus pyogenes*, and *Candida albicans*. Complement-fixation tests for influenza A, B, and C, adenovirus, psittacosis, lymphogranuloma venereum, and Q fever were negative. Chest radiographs showed diffuse cloudy opacities extending from both hila, but sparing the periphery—an appearance suggesting pulmonary œdema (fig. 2). Electrocardiograms showed non-specific T-wave inversion in precordial leads.

He became progressively more dyspnœic and he was intermittently cyanosed. He continued to complain of pleuritic pains, variable in site and degree. The chest signs did not alter, but serial radiographs showed extension of the opacity to the periphery of the lung fields. Because he had had steroids for a year he was treated empirically with antibiotics, though no infective cause for his fever was found. He was given successively tetracycline, streptomycin, and chloramphenicol. A low-salt diet and chlorothiazide produced no diuresis. At the end of December he became acutely dyspnœic and died within a few hours.

*Necropsy Findings*

The body was thin, with extensive scarring of the face and upper trunk consistent with healed acne, and with several seborrhœic warts on the dorsum of the hands. The right leg and genitals were œdematous, and there were some raised pink nodules, about 4 mm. across, on the buttocks and genitals.

The skull, dura, venous sinuses, meninges, cerebral blood-vessels, and pituitary gland showed no significant lesions. The brain weighed 1410 g. and appeared normal on section. The teeth, gums, tongue, pharynx, œsophagus, and thyroid were normal macroscopically. The heart weighed 240 g.; the pericardium, myocardium, endocardium, valves, and chambers appeared normal, and there was no detectable atheroma of the coronary arteries. The right pleural cavity contained 240 ml. of cloudy orange fluid, and the pleuræ of both lungs were lightly coated with a fibrinopurulent exudate. There was mucopus in the trachea and both main bronchi. Both lungs were abnormally heavy, the right weighing 1190 g. and the left 1310 g. On section, the lung tissue was uniformly firm and greyish white, appearing completely airless apart from an occasional small group of aerated alveoli. The hilar nodes were not enlarged.

The peritoneal cavity, the stomach, and the intestines appeared healthy. The liver weighed 1620 g. and showed a little patchy pallor on section. The gallbladder, bile-ducts, pancreas, and adrenals were normal macroscopically. The spleen weighed 120 g. and showed a small subcapsular infarct. The kidneys each weighed 120 g.; their subcapsular and cut surfaces appeared normal. The ureters, bladder, and prostate were normal, the inferior vena cava, and the right iliac and femoral veins showed no thrombosis or other lesion. The sternal and ver-

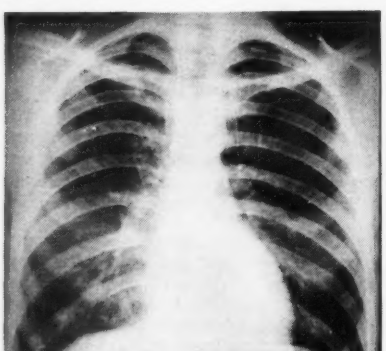

Fig. 1—Normal chest X-ray (July, 1959).

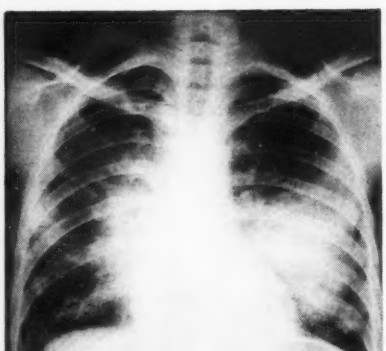

Fig. 2—Chest X-ray on admission (October, 1959).

tebral marrow appeared normal; a little red marrow was mixed with the fat in the midshaft of the femur.

*Histology*

The histological appearances of the lungs were in most ways typical of alveolar proteinosis.

Nearly all the alveoli, bronchioles, and small bronchi were full of a granular eosinophilic material which was strongly periodic-acid/Schiff (P.A.S.) positive, and which contained acicular clefts. The lining alveolar cells had swollen and proliferated to form a continuous lining to most alveoli (figs. 3 and 4). These cells were often vacuolated, and sometimes contained P.A.S.-positive granules: some large foamy cells lay freely in the intra-alveolar material, and occasionally more deeply staining laminated bodies, apparently the remnants of disrupted cells, could be seen. A few intra-alveolar red cells were present but no gross hæmorrhages. In frozen sections, the swollen intra-alveolar cells were seen to contain a great deal of sudanophilic material, and a large number of long thin birefringent crystals, which were not sudanophilic, corresponded to the acicular spaces seen in paraffin sections.

The alveolar walls showed moderate patchy fibrosis, which in general contained no inflammatory cells. In a few areas the alveolar contents had calcified in toto, apparently having shrunk to form a group of calcified, often laminated, bodies embedded in dense fibrous tissue. Occasionally the alveolar contents were reduced to a mass of crystals, which also became

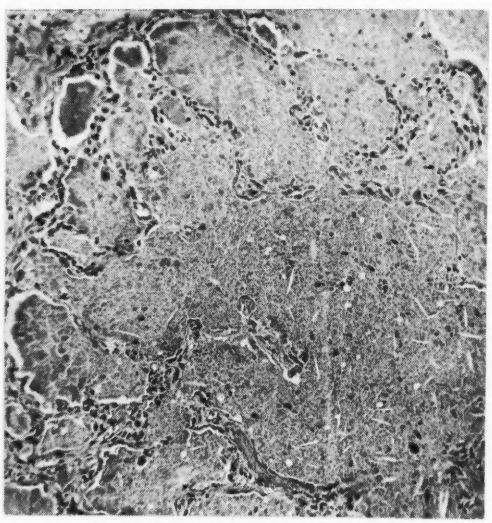

**Fig. 3—Photomicrograph of lung (×110).**

surrounded by fibrous tissue with loss of the alveolar structure. No pneumocystis organisms or other pathogens could be identified with Gram's stain, Jenner-Giemsa, or Gomori's methanamine-silver method. Superimposed on this general picture in a few parts of the lung there was a patchy non-specific bronchopneumonia, and acute pleurisy was generalised. In the areas of bronchopneumonia the polymorphs appeared to phagocytose the abnormal material. A single microscopic abscess was packed with fungal hyphæ which resembled aspergillus rather than candida. The walls of the bronchi and the blood-vessels appeared normal. Only a very occasional eosinophil leucocyte was seen. The bronchial lymph-nodes did not contain abnormal material.

Sections from the thyroid, pituitary, brain, heart, kidney, and œsophagus were normal. The liver and spleen contained some hæmosiderin. The nodules on the buttocks showed only dermal fibrosis. Active erythropoiesis was seen in the femoral marrow. The testicular tubules were lined exclusively by Sertoli cells, and spermatogenesis was not visible.

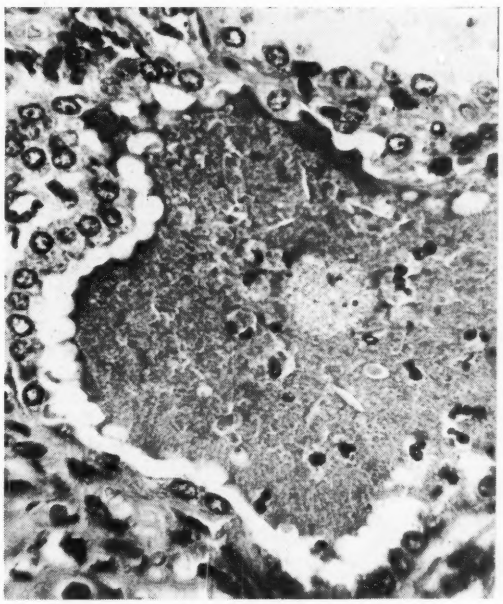

**Fig. 4—Photomicrograph of an alveolus (×500).**

## Discussion

The cause of pulmonary alveolar proteinosis is unknown. No specific pathogens have been isolated. Though a few patients have been exposed to various dusts, most have not; nor do the lesions resemble those of the various pneumoconioses. In one case alveolar proteinosis developed two years after the successful treatment of pulmonary tuberculosis (Payseur et al. 1958). None of the previous cases have had aplastic anæmia, though 2 had severe acne (Rosen et al. 1958, Sieracki et al. 1959), and it seems that these conditions are unrelated to alveolar proteinosis. The nature of the intra-alveolar material is obscure: its staining reactions indicate a high content of carbohydrate, and it also contains about 20% fat (Rosen et al. 1958).

Clinically the disease is not very well defined. It seems to be about three times as common in men as in women, and it usually occurs in adults, though it has been reported in 2 children, aged $2^1/_2$ and 15 years. The symptoms vary. The commonest sequence is (as in our case) a febrile influenza-like illness with no localising features, followed by a symptom-free interval, and then by the onset of progressive dyspnœa associated with a productive cough, low-grade fever, chest pain, and loss of weight. Despite severe dyspnœa the physical signs are unimpressive. Scattered coarse or fine rales may be heard, but not a friction rub even in the presence of pleuritic pain. Cyanosis and finger-clubbing have been seen when the illness was severe. In one of Rosen's patients, who had had the disease for four years, evidence of right ventricular failure and pulmonary hypertension was confirmed by cardiac catheterisation.

The radiographic changes, characteristic though not pathognomonic, comprise fine diffuse perihilar shadowing, which may extend to the periphery as the disease progresses. The mediastinal lymph-nodes are not enlarged. The initial radiological diagnoses have included pulmonary œdema, sarcoidosis without glandular enlargement,

pneumoconiosis, and pulmonary infection, particularly viral or fungal.

The hæmoglobin level is often high, which is unusual in a febrile wasting illness, but this may be part of a secondary polycythæmia. Otherwise no constant hæmatological or biochemical abnormality has been found. Only three earlier reports have included a full differential leucocyte-count, but there has been no mention of eosinophilia, which was such a striking feature of our patient's last illness. Pulmonary function tests show no characteristic abnormalities. Severe cases have evidence of an alveolar-capillary block.

Pathologically the most difficult differential diagnosis is from *Pneumocystis carinii* pneumonia. Although typically a disease of infants, this has been reported in adults, usually associated with cytomegalic inclusion disease or a reticulosis (Hamperl 1956, Můr 1959, Symmers 1960). As Hamperl (1957) has pointed out, the characteristic plasma-cell infiltrate may be absent, when the picture may closely resemble that of alveolar proteinosis, with epithelialised alveoli containing P.A.S.-positive masses. The organism can usually be readily stained with Gram, Giemsa, or Gomori's methanamine-silver method, and the birefringent crystals (or acicular clefts) have not, to our knowledge, been reported in pneumocystis pneumonia except in the first case of Reye and ten Seldam (1956). But this child was $2^1/_2$ years old (exceptionally old for pneumocystis), plasma-cells were scarce, and only a very occasional organism could be identified: otherwise the appearances were typical of alveolar proteinosis, which in retrospect may have been the basic disease.

Pulmonary fibrosis has been recorded previously only twice: in a man in whom the biopsy was taken four years after illness started, and at necropsy in a patient dying fourteen months after the first symptom. So far as we know, calcification has not been previously recorded. Although the laminated calcified bodies resembled superficially those of microlithiasis alveolaris pulmonum, they were not birefringent, and were always seen in disorganised fibrosed alveoli; so an ætiological relation between the two conditions is unlikely. The failure of spermatogenesis in our case could not be satisfactorily explained: œstrogens had not been given, and the skin near the testes had not been irradiated.

The prognosis is very variable. None of the original series had been observed longer than five years, but during that time 8 died, all with respiratory insufficiency, which was associated in 3 cases with a fungal infection. 5 (1 of whom showed complete radiographic resolution) improved over periods of nine months to five years. No effective treatment is known. Neither antibiotics nor steroids have been of any benefit except in the case reported by Moertel et al. (1959), which improved while prednisolone was given. In fact simultaneous broad-spectrum antibiotics and corticosteroids may well predispose to secondary fungal infection, as in our case. In the only 2 cases in which it has been given, potassium iodide may have helped: in 1 it was used during the prodromal illness (Lull et al. 1959) and in the other in the fully developed illness, when the very high dosage of 8 g. daily was given, with complete recovery over the next few months (McDowell et al. 1959).

In only 1 case (Carlson and Mason 1960) has alveolar proteinosis been diagnosed before thoracotomy or necropsy. Sections of fixed sputum showed laminated bodies and acicular clefts in granular material, with the typical staining reactions. Diagnosis from fresh sputum may be possible. Fat-laden macrophages, which are so striking a feature of many cases, are common in several other pulmonary conditions (Waddell et al. 1949) and have been found in the sputum in a high proportion of cases of bronchial carcinoma (Hammer and Rohrbach 1959). The birefringent crystals, on the other hand, are probably specific for alveolar proteinosis, and might be detectable with polarised light in unfixed material.

**Summary**

A 21-year-old man with aplastic anæmia, progressive lymphœdema, and severe acne developed fatal pulmonary alveolar proteinosis with much eosinophilia. At necropsy the typical changes of this condition were found—namely, firm greyish-white airless lung tissue—with, in addition, patchy fibrosis and calcification.

We are grateful to Dr. J. F. Wilkinson for permission to publish this case-report; to Dr. M. C. G. Israëls for reports on the bone-marrow; to Prof. A. C. P. Campbell and Dr. George Williams for advice; and to Dr. R. Ollerenshaw, of the department of medical illustration, and Mr. N. Mowat for preparing the figures.

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## Preliminary Communication

## SEROLOGICAL DIFFERENCE BETWEEN OLD AND YOUNG CELLS

VARIOUS experiments have been done to determine the life-span of erythrocytes, but very little is known concerning the mechanism by which aged cells are removed from the circulation, though antigenic changes in the red-cell surface on storage, revealed by an increased erythrophagocytic index [1] and by agglutination,[2] have been described. In the serum described here it was found that a change in the red-cell surface takes place on ageing in vivo as well as in vitro.

### SEROLOGICAL FINDINGS

The serum of a married woman, aged 71, with anæmia secondary to Hodgkin's disease, was referred to us owing to difficulty in the cross-matching test. Her hæmoglobin was 7·3 g. per 100 ml., red blood-cells 2,700,000 per c.mm.; and she had received no recent transfusion, but had been transfused eighteen months previously during a splenectomy. The patient died early in the investigation and this unfortunately prevented study of the clinical effects of the agglutinating property.

Examination of her blood showed that she was group O, $R_2r$, Ns, P+, Lu(a−), K−, Le(a−b−), Fy(a+), Jk(a+), and that her serum agglutinated all of a wide range of test cells, though these tests, together with a number of absorptions, failed to disclose any specific blood-group antibody. It was noticed, however, that stored cells gave stronger results than freshly collected ones, while cells preserved in glycerin citrate at −20°C

1. Moskowitz, M. *Nature, Lond.* 1955, **175**, 595.
2. Jenkins, W. J., Marsh, W. L. Personal communication.

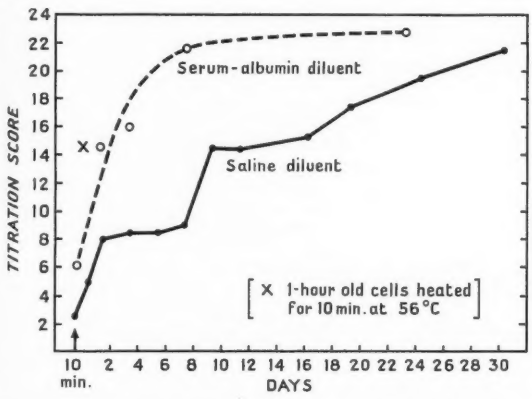


**Fig. 1—Effect of storage of red cells on strength of agglutination.**

were agglutinated more strongly still, and further tests confirmed that the strength of the agglutination depended on the period of storage. The patient's serum agglutinated her own cells only feebly when they were fresh but more strongly after storage.

The agglutinin was most strongly active at 37°C against cells suspended in serum-albumin, though it also agglutinated cells in saline suspension, strongly at 37°C and less strongly at 16°C. In the indirect Coombs test, the cells were equally strongly agglutinated following washing, whether anti-γ-globulin, anti-non-γ-globulin, or saline was added to them; but the direct Coombs test using the patient's own fresh cells was negative. Further testing was carried out mainly by the saline-agglutination and serum-albumin techniques at 37°C.

The effect of storage on the strength of the agglutination is illustrated by fig. 1, which shows the results of an experiment in which a sample of blood was taken from a normal healthy donor into small bottles containing A.C.D. anticoagulant. These were stored at 4°C for various periods, following which the cells were washed and tested in saline and in serum-albumin suspensions against a series of doubling dilutions of the patient's serum at 37°C. The agglutination score was plotted against time of storage. The score given by fresh cells, artificially aged by heating at 56°C for 10 minutes, is also shown and is equivalent to that given by the same cells stored for 14 days at 4°C. Similar results were obtained when cells were stored in E.D.T.A., heparin, and as defibrinated blood.

The agglutinating property could be removed from the serum by absorption with stored cells, though we were unable to recover it by elution at 56°C. The property was not affected by heating the serum at 56°C for half an hour, nor by the addition of H-secretor or non-secretor saliva. No reversal of agglutination took place on incubation at 37°C for 20 hours; and when cells agglutinated by the serum were washed repeatedly in saline they remained agglutinated, showing that the agglutinating factor was firmly attached to them.

Two interesting features were that the appearance of the agglutination was unusual, only some of the cells being agglutinated, and that the reaction was so rapid that strong agglutination could be obtained after only 2 minutes' incubation at 37°C followed by centrifugation.

The patient's serum contained only 10 units per ml. of complement (normal range 85–100). By treating stored cells with inactivated patient's serum for very brief periods followed by normal fresh serum and then testing with anti-non-γ-globulin, fixation of complement could be demonstrated.

Treatment of saline suspensions of red cells with alumina, with 1·03 *M* NaCl, or by multiple washings, all result in pronounced losses of lipids from the red-cell surface, similar to those which take place on storage,[3] but none of these treatments had any effect on the strength of the agglutination in this case.

A sample of blood from a normal donor, freshly collected into A.C.D., was separated by the differential centrifugation method of Constandoulakis and Kay,[4] so as to give a high percentage of young cells in one portion and a high percentage of aged cells in a second portion. It was found that the proportion of agglutinated cells was small in the first portion and large in the second, showing that the change in the red-cell surface, which is detected by this serum, takes place in vivo, though possibly at a slower rate than in vitro (see fig. 2).

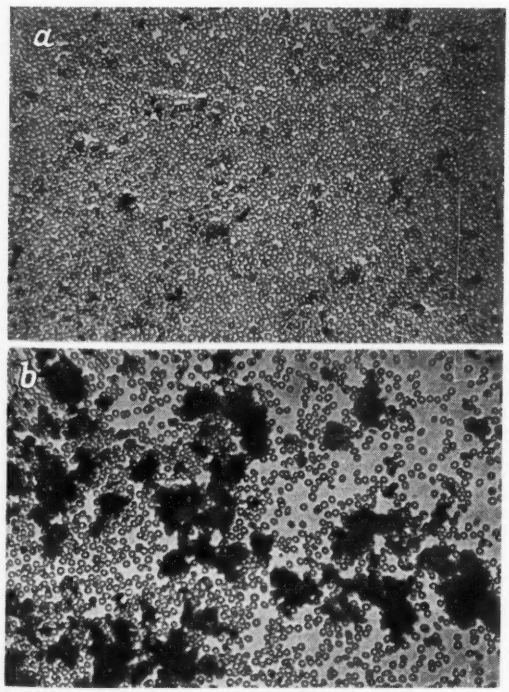


**Fig. 2—Agglutination of young and old red cells separated from a sample of blood: (*a*) portion containing a high percentage of young cells; (*b*) portion containing a high percentage of old cells.**

## DISCUSSION

The reactions of this serum were not easy to interpret. When a fresh sample of the patient's blood was examined it was at first thought, in view of the weak result with her own cells, that a blood-group antibody of some kind was present. Using an older sample of the patient's cells, however, the agglutination was a good deal stronger and the pattern of results obtained resembled that given by a warm autoagglutinin, such as is sometimes seen in cases of acquired hæmolytic anæmia. Indeed, it may well be that there is a relationship with such cases.

On further testing it became clear that we were not dealing with a specific blood-group antibody, but with an agglutinin active against stored cells. The nature of this agglutinin is unknown. If it is an antibody the source of the antigenic stimulus is obscure, and further experiments will be necessary in other cases to determine its nature.

The appearance of a mixed agglutination, with both agglutinated and free cells present, was ascribed to the presence of cells of different ages, and this supposition was confirmed by the differential centrifugation experiment.

A change of some kind in the red-cell surface, occurring on storage and also on ageing in the circulation, could be

3. Lovelock, J. E. *Nature, Lond.* 1954, **173**, 659.
4. Constandoulakis, M., Kay, H. E. M. *J. clin. Path.* 1959, **13**, 312.

demonstrated by means of this serum; and it is interesting to speculate as to what part, if any, this change plays in the normal process by which effete red cells are destroyed. We do not know what part it played in the causation of the patient's anæmia, though it seems possible that the feeble nature of the agglutination of a fresh sample of the patient's cells by her own serum might have been due to an increased rate of elimination of aged cells from her circulation.

We are indebted to Dr. R. M. Fulton, Stepping Hill Hospital, Stockport, for the clinical details of this case.

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## Reviews of Books

### Selected Papers

SIR GEOFFREY JEFFERSON, C.B.E., M.S., F.R.C.P., F.R.C.S., F.R.S., emeritus professor of neurosurgery, University of Manchester. London: Pitman Medical Publishing Co. 1960. Pp. 575. 105*s*.

THESE twenty-nine personally selected papers are representative of all that is best in Sir Geoffrey's writings. During the past thirty years he has had few equals in the profession of surgery, either for the range of his interests and knowledge or for the philosophy of his thought. The book is largely formed by original papers on the tentorial pressure cone, the chiasma and aneurysms, the pituitary, the cavernous sinuses, the frontal lobes, and the problems of consciousness and its loss which have interested him for so long. There are accounts of the lives, personalities, and works of some of the neurosurgically great of the past, among them Sir William Macewen, Sir Victor Horsley, and Harvey Cushing. These sketches show the author's belief in the axiom that we cannot fully understand the present without knowing too the ancestry of today's ideas and today's achievements. Some essays of a more general kind deal with philosophical questions and personal reminiscences, all essentially neurological in a wide sense. Preference has been given in the main to papers published some years ago, making them more accessible to the younger generation. But it is in no way a book of operative surgery.

This writer of charm, wisdom, and unrivalled experience begins characteristically by meditating on the sources of knowledge and ends by reflecting " on being happy and liking it ". This splendid book will fascinate neurologists, philosophers, and medical historians: the like of it rarely comes our way.

### Modern Trends in Pathology

Editor: DOUGLAS H. COLLINS, O.B.E., M.D., F.R.C.P., professor of pathology, University of Sheffield. London: Butterworth. 1959. Pp. 460. 65*s*.

WHETHER one looks on it as a defect or as a merit, this book reflects not the trends but the crisis in modern pathology. It is the crisis which animates much of the controversy about a pathologists' college; and its outcome may influence all branches of medical practice in this country for many years. It has been brewing ever since pathology ceased to be synonymous with morbid anatomy, without, at the same time, acquiring a precise new meaning. At least two-thirds of the volume will be outside any one reader's immediate interest. The chapters, written by a galaxy of professors, range from such orthodox morbid anatomical subjects as rare and recently identified tumours (by Prof. R. A. Willis) to the biochemical vagaries of 5-hydroxytryptamine; and from cancer in Africa (brilliantly surveyed by Prof. J. N. D. Davies) to occupational lung diseases: they have not even in common such negative qualities as a comparative unconcern with bedside practice.

To do justice to such a work a committee would have to review it. The contributors set a very high standard and the same is expected from the reader. Even chapters of wide " general " interest such as Sir Roy Cameron's on the injured cell and Prof. R. J. V. Pulvertaft's on the examination of pathological tissues on the fresh state are no light reading: they provide food for active minds, not stimulants for the sluggish. The more specialised sections may provoke some to wonder what modern pathology does not include. Are we witnessing the beginning or the end of Virchow's dream—pathology, the mirror of all medicine and surgery?

### Fluid Balance in Obstetrics

PHILIP RHODES, M.B., F.R.C.S., M.R.C.O.G., consultant obstetrician and gynæcologist, St. Thomas's Hospital, London. London: Lloyd-Luke (Medical Books). 1960. Pp. 169. 25*s*.

THERE are several excellent short books on fluid balance in surgery, and a similar volume dealing with fluid balance in obstetrics is welcome. The author is a practising obstetrician, which gives him the advantage of direct familiarity with the specific clinical situations, perhaps at the expense of really expert knowledge of fluid balance. Unless the author has been unduly modest, the references at the end of each chapter seem to indicate that he has not contributed original work in this field; but he has been diligent in surveying the literature. In some chapters indeed the resulting picture is a little confusing, notably in the account of eclampsia—admittedly not an easy subject to handle. His own view emphasises the importance of " stress ", and regards changes in fluid balance as secondary. The book is well written, and easy to follow, and gives a good general account of fluid balance. In places the recommendations are rather behind current practice—for example, the condemnation of mercurials because " they have to be given intravenously " (p. 104), or the routine use of penicillin in anuria, and also the rather high water intake in that condition. There are some quantitative errors: aldosterone output is given in mg. instead of μg. (p. 99) and the protein content of œdema fluid is given as " 0·24 Gm. per ml." (p. 92). The author's intentions are so good that it may seem hard to criticise his performance; but in the next edition he might care to seek the collaboration of a specialist in the fluid-balance aspect.

### Massage, Manipulation, and Traction

EDITOR: SIDNEY LICHT, M.D., assistant clinical professor, Yale University School of Medicine. New Haven, Conn.: Elizabeth Licht. 1960. Pp. 275. $10.

THIS is the fifth volume in an American series devoted to a detailed examination of the techniques of physical medicine. Previous titles were concerned with such agencies as heat, exercise, and electrical energy: this one deals with what is probably the most venerable of all the methods with which man has tried to heal his fellows.

It has also proved the most contentious, and, perhaps for this reason, the book has a slightly apologetic tone throughout. Yet it is, in fact, a carefully reasoned and exact study of a subject where precision is notoriously elusive. Even those who are unenthusiastic about manipulative treatments will find a certain fascination in its pages; for they contain a very exhaustive survey of the early history of physical medicine (with over 170 references), and a description of the ' Syncardon ' which amplifies the radial pulse and uses it to trigger synchronous pressure waves applied to the lower limbs in the treatment of obliterative vascular disease.

### Hypnosis in Anæsthesiology

MILTON J. MARMER, M.D., M.SC.MED., chairman, department of anæsthesia, Cedars of Lebanon Hospital, Los Angeles, California. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1960. Pp. 150. 54*s*.

AS a practising anæsthetist, Dr. Marmer propounds the view that the surgical patient is best not told that hypnosis is to be attempted—not at any rate in the first place—but that an exercise in relaxation is to take place. This is the

sort of preoperative talk that any patient might expect, and it may occasionally lead to a trance state. As a thesis, however, it indicates that Dr. Marmer is interested in the value of suggestion as an adjunct to chemical anæsthesia, perhaps more so than in hypnosis as a substitute for it. He has written a practical account of the subject, describing in detail the methods of trance induction, and illustrating by case-reports its uses for various operations. This is a very fair account of the potential value of hypnosis to the anæsthetist.

**Recent Advances in Cardiology** (5th ed. London: J. & A. Churchill. 1960. Pp. 421. 45*s*.).—Ten years have elapsed since the previous edition of this well-known work, and cardiology has been completely reorientated by physiological investigations and cardiac surgery. The new edition is edited by Dr. Terence East and Dr. Curtis Bain. It may be questioned whether this volume, even though enlarged to the size of a small textbook, can do justice to this revolution, for it has to cover both common and rare diseases and give full references. Inevitably it has become difficult to read in places and sometimes difficult to understand. There is little room for the enunciation of general principles or for the clinical and physiological approach which has been perhaps the strength of British cardiology. The section on congenital heart-disease lacks the physiological approach and some statements are hard to follow (e.g., "The modern trend of thought is to link up the Roger type of ventricular septal defect with that included in the syndrome of Eisenmenger"). The inclusion of Roger's description of the systolic murmur in small ventricular septal defects is valuable and there is a very good section on acute and chronic rheumatic carditis. It is stated that the causes of cardiogenic syncope are well known and include complete heart-block; but complete heart-block does not produce syncope unless the ventricular pacemaker has failed, causing arrest, and arrest is not necessarily associated with complete heart-block. The systolic murmur in hypertension is ascribed to mitral regurgitation and the much commoner and unimportant aortic systolic murmur is not mentioned. Though this book is not altogether suitable for undergraduates or those training in cardiology, it is a very useful compilation of facts and references, and it is finely produced.

**Current Therapy 1960** (Philadelphia and London: W. B. Saunders. Pp. 808. £4 4*s*.).—In the twelfth annual edition of this excellent work, edited by Dr. Howard F. Conn, the general layout and the subjects covered are much the same as last year, but many of the articles are by new authors. The whole range of general medicine is covered, as well as dermatology and obstetrics and gynæcology. Only psychiatry is poorly represented, and in view of the ever-increasing use of drugs in this specialty the gap is surprising. The book is 27 pages longer than the last edition but the price is not increased. It remains extremely good value as a work of reference for the practitioner or the hospital library.

**New and Nonofficial Drugs 1960** (Philadelphia: J. B. Lippincott. Pp. 768. 30*s*.).—This annual publication of the Council on Drugs of the American Medical Association is chiefly concerned with drugs generally available in the United States that have not been included in the *U.S. Pharmacopeia*, the *National Formulary*, or *New and Nonofficial Drugs* in the previous twenty years. It is a very valuable guide to pharmaceutical innovation and progress.

## New Inventions

### A CLINICAL THERMOMETER

THIS simple, accurate, and rapid thermometer for clinical use depends upon thermistors (negative-temperature-coefficient resistors) as heat-sensitive elements. The thermal ohmic change is measured by a very stable bridge circuit based on that originally developed by Phillips Laboratory (S.A.) Ltd.

The thermometer consists of a bridge circuit, meter-adjusting potentiometers for fine and coarse adjustment, and a 6-volt battery (fig. 1). The negative-temperature-coefficient resistors are connected to the circuit by extension leads and telephone jack plugs. Three small shunt resistors of 1·5 kilohms are inserted in the jacks as shown, to protect the meter if one or more thermometers are taken in or out of circuit while the instrument is switched on.

When the temperature of the resistor rises or falls the bridge circuit is unbalanced, giving a meter deflection proportional to the change of temperature.

Fig. 2 shows the thermometer built in the department. The instrument was designed specifically as a clinical thermometer and is used for determining skin, rectal, and intra-abdominal temperatures, especially during hypothermia. (The thermometer can be enclosed in a thin plastic sheath.) It is also used during laboratory experiments with animals.

All three temperature-sensitive elements may be used simultaneously: a three-pole switch selects the one from which the reading is to be made. The range of temperature is from 15°C to 40°C with an accuracy of ± 0·1–0·25°C. The equipment costs between £10 and £12.

Thanks are due to Messrs. Phillips Laboratory (S.A.) Ltd. for permission to modify the original circuit.

Department of Surgery,
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C. J. LOCKETT
D.E.E. Lond., Technician

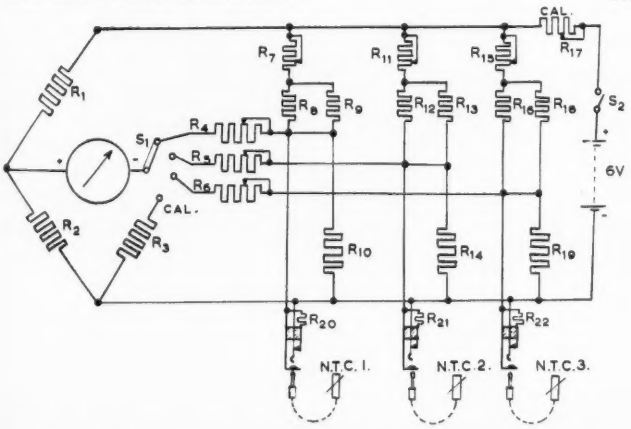
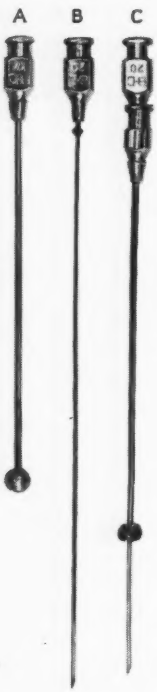



**Fig. 1—Circuit diagram. N.T.C. = negative temperature coefficient resistors.**

**Fig. 2—Clinical thermometer (about 1/4 actual size).**

## GUIDE FOR PUDENDAL NERVE BLOCK

PUDENDAL nerve block by the transvaginal method is gaining increasing support from obstetricians throughout the world. The method has already been described by Huntingford.[1] In practice it helps to use a guide which prevents the needle from piercing the operator's glove or the vaginal wall during introduction.




Such guides have been described in the past two years by Kohl[2] and Velarde.[3] Our guide has the virtue of simplicity, being easy to make, to clean, and to sterilise. It has been in use since March, 1957, and has been received enthusiastically by our colleagues.

The guide is made by tightly fixing a metal bead to the sharp end of a 4-in. no. 17 needle. The protruding sharp end is then ground off (see figure A). With the index finger the beaded end of the guide can be easily placed in position beneath the tip of the ischial spine. A 5-in. no. 20 needle (B) is then passed through the guide (C) until it is felt to pierce the vaginal wall. The anæsthetic solution can thus be accurately placed close to the pudendal nerve.

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M.D.
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M.D., M.R.C.O.G.

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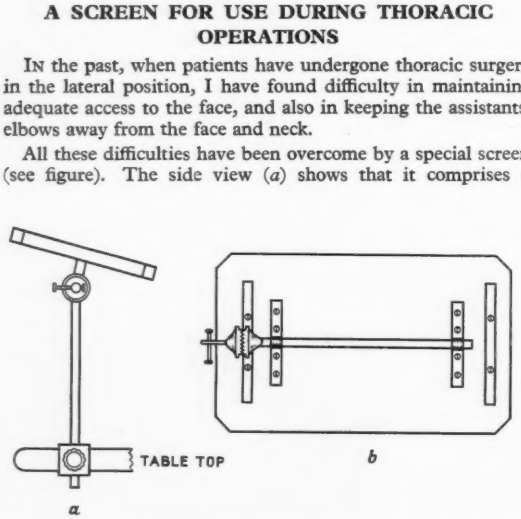
San Francisco, California

## A SCREEN FOR USE DURING THORACIC OPERATIONS

IN the past, when patients have undergone thoracic surgery in the lateral position, I have found difficulty in maintaining adequate access to the face, and also in keeping the assistants' elbows away from the face and neck.

All these difficulties have been overcome by a special screen (see figure). The side view (*a*) shows that it comprises a rectangle of laminated timber, 10 × 22 in., faced all round with 'Formica'. This rectangle is attached to a serrated-face knuckle joint, giving a rigid fore-and-aft tilt of about 270°. The pillar on which the knuckle joint is mounted is 20 in. long, and is clamped to the side rail of the head section of the operating-table. It may thus be raised or lowered, and moved forwards and backwards, as the occasion demands. Because the screen is symmetrically mounted, it can be mounted with the pillar behind the patient's head in either lateral position, leaving unrestricted access to the face for manipulation of endotracheal tubes for suction, or for insertion of œsophageal tubes, bougies, or œsophagoscopes.




The underside view (*b*) shows the attachment of the rectangular screen to the knuckle joint, and, at either end, flat spring clips for securing sterile towels. When the towels have been placed under the clips, small 4-volt or 6-volt bulbs supplied by a transformer may be attached to the centre rod by 'Terry' clips.

As well as its use for patients in the lateral position, the screen has been of value for neonates and infants in the supine position. Our ear, nose, and throat surgeons have also used it as an instrument table when draped with sterile towels.

This screen was made to my instructions by Chas. F. Thackray, Ltd., 10, Park Street, Leeds, 1.

Park Hospital,
Davyhulme,
Manchester

E. G. REES JONES
M.B. Manc., D.A.
Assistant Anæsthetist

## NEW VAGINAL SPECULUM

IT is always difficult to expose the cervix after delivery because the vaginal walls tend to bulge inwards and obscure the view, even if one has an assistant. Suture of a lateral laceration or of Dührssen's incisions under direct vision is therefore sometimes impossible, but the speculum shown in figs. 1 and 2 makes this easy even for the singlehanded obstetrician. The instrument, which is a hybrid of Auvard's and Ferguson's vaginal specula and a proctoscope, has a diameter of 7 cm.

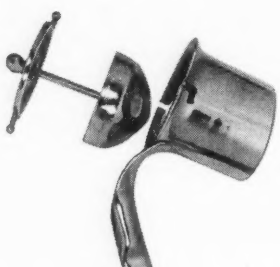


**Fig. 1—Lateral view of speculum, with obturator withdrawn.**

It was made for me by Messrs. Down Bros. and Meyer & Phelps, Mitcham, Surrey.

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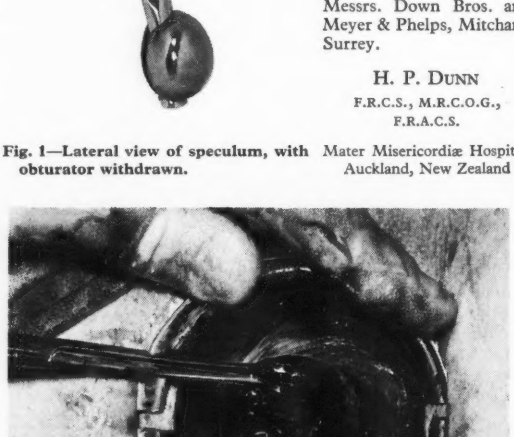

**Fig. 2—Speculum in position, immediately after delivery of placenta.** Sponge forceps on anterior lip of cervix expose the common site of lateral laceration. There is adequate room to operate through it.

1. Huntingford, P. J. *J. Obstet. Gynæc. Brit. Emp.* 1959, **66**, 26.
2. Kohl, G. C. *Obstet. Gynæc.* 1958, **11**, 314.
3. Velarde, A. *ibid.* 1958, **10**, 687.

THE LANCET

LONDON 25 JUNE 1960

## Bedsores of the Gut

HYPOSTATIC pneumonia has been called the bedsore of the lung—an ugly term which yet expresses the widespread feeling that common factors contribute to both. If " bedsore " is used in this comprehensive sense, we should probably include the acute ulcers of the gastrointestinal tract that sometimes arise under the same conditions as these lesions of skin and lung. For long these have aroused scant interest; and many clinicians still dismiss them as " terminal " changes. But our notions of changes that can properly be called terminal should be altering. Even in seemingly moribund patients, maintaining vital processes for a few extra hours occasionally gives Nature a chance to reassert its powers or allows life-saving treatment to be applied. In such cases hope may be frustrated not by the disease which has brought the patient to death's door but by the secondary effects of what, for want of insight, we must describe as a state of lowered vitality. The gravest manifestations of this include the breakdown of protective epithelia—whether of skin, bronchial tree, or gastrointestinal tract.

DALGAARD [1] has reviewed, in a series of 2317 necropsies, 208 cases of acute and 177 cases of chronic gastrointestinal ulcers. 70 of the acute ulcers—or, as DALGAARD prefers to call them, malacias—were associated with cerebrovascular lesions. These included subarachnoid and intracerebral hæmorrhages and thromboses; and the underlying diseases varied from essential hypertension to polycystic kidneys, leukæmia, and Hodgkin's disease. Two of DALGAARD's observations merit special attention. First, though these patients were already dying from intracranial lesions, the gut complications alone could have killed them. Secondly, despite microscopic evidence that these complications had begun several hours or even days before death, none had been diagnosed during life. The concentration of the lesions in the œsophagus, stomach, and duodenum suggests that chemical irritation played a part similar to that of mechanical pressure in the causation of skin sores; but these parts of the gastrointestinal tract are more thoroughly scrutinised at routine postmortem examinations than the distal segments, and it is certainly possible that similar lesions are distributed along its entire length.

Ever since CUSHING's [2] impressive account of acute duodenal ulceration following neurosurgical operations, a link between diseases of the central nervous system and of the gastrointestinal tract has been widely accepted [3]; but how direct this relation may be is still far from clear. More than a hundred years ago ROKITANSKY [4] pointed out that acute gastrointestinal erosions are a common necropsy finding in diverse illnesses—" poisonings, chlorosis, cerebral diseases, eclampsia, burns, trauma, local infiltration, infection, and general sepsis "—and BRINTON [5] suggested in 1864 that " these [gastrointestinal] lesions complicate different illnesses in proportion more akin to their known frequency than to any other circumstance ". We have certainly never been able to define, either anatomically or functionally, " ulcerogenic " loci in the central nervous system. In the 1930s BALÓ and other workers sought to demonstrate that damage to certain vasomotor centres in the midbrain could initiate vascular changes in the gastric mucosa; but similar lesions were later produced by experimental intracranial trauma in which the midbrain was safeguarded.[6–8] Support for BRINTON's view has come from a series of new causes which the passing decades have added to ROKITANSKY's list. Two world wars have introduced us to air-raid, frostbite, trench, and famine ulcers—and to the acute ulcers of the bomb-victims of Hiroshima and Nagasaki. In 1867 one of BILLROTH's first thyroidectomy patients died from massive duodenal hæmorrhage on the fifth postoperative day. Today no organ of the body remains surgically unexplored—and, whatever the organ, postoperative acute ulcer occasionally ensues. ROGER [8] has reported from Hungary three cases of gunshot wound admitted to a Budapest general hospital in the fateful autumn of 1956: all three patients died, while recovering from their wounds, from massive gastroduodenal hæmorrhage or perforation. And (reflecting, perhaps, the diversity of 20th-century *conditions humaines*) SHIPP et al.[9] have issued from Boston another warning against ulcers complicating the acute phase of myocardial infarction.

Despite such multiformity of underlying diseases, many clinicians and pathologists still believe that intracranial lesions carry an especial risk. STRASSMANN,[10] who studied the prevalence of peptic ulcers in 1400 medicolegal and mental-hospital necropsies, found that of 26 acute ulcers all but 2 were associated with intracranial hæmorrhage; and, though DALGAARD's material is not suited to statistical analysis, he believes that cerebral apoplexy is particularly liable to result in gut complications. Whether or not, on numerical grounds, " neurogenic " ulcers deserve a special niche, morphologically they are indistinguishable from other secondary gastrointestinal ulcers. Clinically, too, these lesions have at least one feature in common. Whether the primary disease has been a burn, multiple injuries, fulminating sepsis, snakebite, exposure, or a stroke, the patient is

1. Dalgaard, J. B. *A.M.A. Arch. Path.* 1960, **28**, 359.
2. Cushing, H. *Surg. Gynec. Obstet.* 1932, **55**, 1.
3. See *Lancet*, 1955, i, 495.
4. von Rokitansky, C. Handbuch der speziellen pathologischen Anatomie; vol. 2. Vienna, 1842.
5. Brinton, W. Lectures on Diseases of the Stomach. London, 1864.
6. Baló, J. *Acta morphol.* 1951, **1**, 167.
7. Baló, J. *Zschr. allg. Path.* 1958, **21**, 561.
8. Roger, M. *Orvosi Hetil.* 1960, **101**, 663.
9. Shipp, J. C., Sidel, V. W., Donaldson, R. M., Gray, S. J. *New Engl. J. Med.* 1959, **261**, 222.
10. Strassmann, G. S. *Beitr. gerichtl. Med.* 1952, **19**, 162.

either in a state of shock or (more commonly) recovering from it—the term "shock" being used in its time-honoured sense rather than restricted to the effects of sudden or massive blood-loss.

The clinician need hardly concern himself with the vexed question whether hormonal or nervous irritants play the predominant rôle in the breakdown of gastro-intestinal mucosal resistance; but thought is certainly needed for devising a prophylactic régime. Ignorant though we are about most ætiological factors which combine to produce bedsores and hypostatic pneumonia, we have at least, by trial and error, evolved preventive measures which succeed in a high proportion of cases. However slender his chances of survival, the burned patient is still carefully positioned in bed; and bedsores, even in comatose victims of a stroke, are rightly regarded as a blot on the nursing care. But mouthwashes and occasional enemas are the beginning, middle, and end of gastrointestinal nursing. We should guard against acting on slender theoretical grounds; but should we not consider whether the withholding of food by mouth from ill, shocked, semicomatose, and comatose patients does not needlessly expose their gut mucosa to severe chemical irritation? Intravenous therapy can provide water, salt, and calories; but it cannot neutralise or dilute gastrointestinal enzymes, nor stimulate peristalsis. Was there some sense, after all, in that much-maligned cup of hot sweet tea?

## Neurology in Great Britain

MEDICAL specialties wax and wane for a variety of reasons. Neurology in the United States, for example, held a high position until the first world war. Then the rise of neurosurgery and the influence of HARVEY CUSHING's powerful personality made many people believe that anything a neurologist could do a neurosurgeon could do better; and neurosurgery added to its prestige by throwing new light upon many functions of the brain. Simultaneously, by a kind of pincer movement psychoanalysis sought to remove much of the mind from the neurologist's province. But now for some time American neurology has been getting its own back, partly by showing that there are many important problems which neither neurosurgery nor psychoanalysis can solve, and partly by doing something towards their solution. American neurology owes its present thriving state to several factors, the most important of which are the close relationship between neurophysiology, neurochemistry, neuropathology, and clinical neurology, and the expenditure of a great deal of money on training and research. The result is that any senior neurologist who wants to go on doing research can do so, and all promising young neurologists have the opportunity to work on research projects in the departments of senior neurologists who are research-minded.

Dr. DENIS BRINTON[1] in his presidential address to the neurological section of the Royal Society of Medicine was mainly concerned to stress the inadequacy of the number of neurological consultants in the Health Service for the needs of the country. Things are somewhat better than they were, but the neurological service is still seriously understaffed. There are still some areas with no neurological consultant, and many regional-board areas have no neurological senior registrar. There, consultants have only untrained staff to assist them in their hospital work, and there is no-one but an already hardworked colleague to do the work of two at times of holiday or sickness. It is often impossible for the provincial neurological consultant to get away for even half a day to attend a meeting in London. What is the use of suggesting that such people ought to be doing research?

Research is the key to the status of neurology in this country, for no branch of medicine can retain the respect of its colleagues and rivals unless it is clearly advancing the boundaries of knowledge in its own sphere. If British neurology was more evidently doing that it would not need to fear disparagement. The long and distinguished tradition of neurology in this country is illustrated by the history of the National Hospital (which is celebrating its centenary this week), and there is no doubt that neurology still has as important contributions to make to medical science as any other specialty. Yet in 1959 England and Wales had only 67 neurologists. As BRINTON shows, we have 1 neurologist for half a million of the population in the Metropolitan area, and 1 per million in the Provinces. Neurological research can no longer be done by the individual clinician in his spare time. Yet the number of whole-time research-workers in neurology is very small, and is not increasing. The Health Service gives no encouragement to the clinician who wants to continue to devote part of his time to research. In any case there are not the laboratories or technicians to make possible the expansion of research. Moreover, though an active postgraduate institute of neurology is essential it is not enough by itself: there should be research facilities in every major neurological department. It is sometimes said that neurology is suffering from lack of contact with general medicine. BRINTON gives reasons for rejecting this view, and it is surely putting the cart before the horse to say that more interest in general medicine would lead to more research in neurology. If neurology had adequate resources for research, its research would invade general medicine.

No doubt neurologists must shoulder some of the blame for the present state of affairs, but by no means the whole. The Minister of Health and the Secretary of State for Scotland are responsible for the welfare and progress of all branches of medicine in the Health Service; the Medical Research Council for research; and the universities for both research and teaching. If British neurology is really in danger of losing the position of leadership it has occupied so long, this is at least partly because the medical profession and the public are content to have it so.

1. *Proc. R. Soc. med.* 1960, **53**, 261.

## The Harvest Mite

THE harvest mite or berry bug is generally regarded as insignificant—one of life's minor horrors, and uninteresting medically because it does not cause serious disease. Yet this mite—*Trombicula autumnalis*—is very widespread; and discomfort occasioned by infestation with it can be intense. Its common names suggest that it is a nuisance only of the countryside; but in towns and semirural areas many cases of trombiculosis may be misdiagnosed as heat spots, urticaria, erythema, or dermatitis.

The larva of *T. autumnalis* hatches in summer in the earth. It is six-legged, red, active, and only 0·2 mm. in size—that is to say, smaller than *Acarus scabiei* and hardly visible to the naked eye. Only this larval stage feeds on warm-blooded hosts; the adult mite lives in the ground throughout the winter, and the eggs are laid in the spring. The normal hosts of the larvæ are rabbits, smaller mammals such as rats and mice, and domestic animals. The larvæ are most numerous in dry summers, especially towards the autumn. They are most liable to be picked up in moist weedy places, on river banks, and in open fields and under and about fruit bushes and trees.[1] They are found also on lawns, in parks, and on golf-courses.

The free-moving larvæ make their way through gaps in clothing at ankles, wrists, or collar to the skin of the limbs and body. As they can travel surprisingly fast (at two feet a minute) over the skin,[2] they soon reach areas distant from the point of entry. The sites most commonly attacked are the ankles (mainly behind the malleoli), behind the knees, the groins, the intercrural and gluteal folds, the insides of the thighs, the waistline where clothing presses, the axillæ, the neck, and the shoulders—places where the skin is soft, thin, and moist. The larvæ feed by attaching themselves to the skin, injecting an irritant lytic fluid into the skin, and sucking the liquefied cell products. Larvæ are not easily found on the skin, because, having fed, they drop off and disappear. The lesion is at first a small weal, intensely itchy, which soon becomes a small papule. The itchiness often persists for days or even weeks with remissions; a papule which has become quiescent may be reactivated by being scratched or rubbed. Persons exposed to attack vary widely in their susceptibility to infestation and in their reaction to the toxic substance injected by the larva. Some people seem to be completely immune, while others are severely affected.[3] Allergy may partly determine the severity of the reaction, and repeated infestation may lead to hypersensitivity, which may pass off in time. Since the intense irritation induces the patient to scratch or rub the lesion, secondary infection may follow. Especially in children, a severe attack may produce constitutional symptoms.

In countries where trombulicid mites transmit serious disease, preventive measures have included clearing away surplus vegetation and treatment of the surface of the soil with powdered sulphur or with acaricides.[4] But much can be done by individuals to prevent access of the larvæ to the body surface. Application of dimethyl phthalate or dibutyl phthalate to ankles, wrists, and neck, and also perhaps to boot-tops, trouser turn-ups, sleeves, cuffs, and neckband, may be found effective if repeated every day or so. Benzyl benzoate, similarly applied, has also proved effective. More lasting prevention can be achieved by impregnating clothing with repellants. In the treatment of the lesions themselves, small dabs of an anti-histamine cream may relieve the itching.

1. Jones, M. B. *Parasitology*, 1950, **40**, 1.
2. Jenkins, D. W. *Amer. J. Hyg.* 1948, **48**, 22, 36.
3. Allington, H. V., Allington, R. R. *J. Amer. med. Ass.* 1954, **155**, 240.
4. Baker, E. W., Evans, T. N., Gould, D. J., Hull, W. B., Kegan, H. L. A Manual of Parasitic Mites of Medical or Economic Importance. National Pest Control Society, Inc., New York, 1954.

## Annotations

### TORQUAY

DECISIONS about the Royal Commission's report having been taken at last month's special meeting,[5] the representative body of the British Medical Association may have been looking forward to an easy time at its annual meeting in Torquay last week. But there is an application of Parkinson's law to gatherings of this kind, and representatives soon found plenty to argue about, though they did not always have brand-new topics to stimulate them.

Drugs for Private Patients has always been a popular banner at representative meetings, and it was again greeted affectionately, seemingly in the confident hope that it was being paraded for the last time. The supply of drugs for private patients through the National Health Service was " a debt of honour owed by the Conservative Party ", announced one standard-bearer. Surprisingly, however, there seemed to have been some backsliding here: last year the representative body threw up only one vote against N.H.S. drugs for private patients; this year no less than eleven dissented, and eleven there remained despite a recount and a rescrutiny, perhaps to dispel a suspicion that the *Lancet* cricket team had somehow got into the hall.

The meeting was unanimously indignant about the hospital building programme. The Government's proposed expenditure over the next five years was regarded as " totally inadequate "; and the squalid and outdated state of large provincial hospitals must be remedied by a replacement policy of greater vigour and efficacy. Mr. H. H. Langston, chairman of the Central Consultants and Specialists Committee, referring to a *Times* suggestion[6] that there was a real danger of overbuilding hospitals, maintained that they had not demanded more beds, simply more up-to-date hospitals. To those who knew the hospitals it was clear that big gaps had to be remedied.

Members of the National Federation of Spiritual Healers should not, the meeting pronounced firmly, be allowed to conduct their practice in National Health Service wards.[7] The spiritualists were condemned as self-styled healers with no justification for the title. They had nothing in common with ministers of religion and their views and methods were entirely different. Of course, Mr. Langston added, the hospital patient had the right to ask whoever he liked to visit him, but should

5. See *Lancet*, May 28, 1960, p. 1178.
6. *Times*, June 16, 1960, p. 13.
7. See *Lancet*, May 28, 1960, p. 1177.

he wish to receive treatment from a spiritual healer it should be made plain beyond all doubt that he was the patient of a doctor of the hospital while he was in hospital, and no treatment of any sort could be allowed which was not directed and authorised by the doctor under whose care the patient was.

The inquiries of the Public Health Laboratory Service's committee [8] on the sewage contamination of bathing beaches in England and Wales had suggested that " with the possible exception of a few æsthetically revolting beaches . . . the risk to health of bathing in sewage-contaminated sea-water can, for all practical purposes, be ignored ". Representatives pronounced themselves flabbergasted at the committee's complacency, and they sympathised with Dr. W. H. N. Angus when he said that the public was not going to be hoodwinked by medical statistics and pathological techniques when they waded into this fæcal flotsam. The pollution of the Solent " sewer " was said to be equivalent to three gallons of sewage in a small swimming-pool, and the meeting was obviously more impressed by this comparison than by assurances that the committee's findings were reasonable.

On Monday a helicopter brought the Duke of Edinburgh, the retiring president of the B.M.A., to join the meeting, and he inducted Sir Arthur Porritt as president for 1960–61.

## SYPHILIS AND THE PUBLIC HEALTH

THE decline of infectious syphilis in Western countries since the 1939–45 war is rightly claimed as highly satisfactory. There can be little doubt that much of this success has been due to penicillin, which has proved a thoroughly effective and comparatively safe remedy. Effective treatment, however, does not completely solve the problem of venereal infections—a fact of which the increase in gonorrhœa in the past few years has forcibly reminded us. In this country the number of patients with infectious syphilis has continued to decline, and has now reached a lower level than any previously recorded. The total number of patients with acquired syphilis of less than a year's duration attending the clinics in 1946 [9] —the year of highest incidence after the late war—was 17,675, but by 1958 the total had fallen to 704.[10] Probably few cases are treated elsewhere than at the clinics and therefore this low figure does not greatly underestimate the prevalence.

The chief medical officer of the Ministry of Health, in his report for 1957,[11] remarked that it was hard to understand why the number of new cases of early infectious syphilis continued to fall despite the continuing rise in incidence of gonorrhœa. He suggested that higher dosage of penicillin, now often given in a slow-release medium for the treatment of gonorrhœa, might in some cases be responsible for aborting incubating early syphilis. Yet early syphilis is beginning to increase in some countries where the same factors may be presumed to operate. The Expert Committee on Venereal Infections and Treponematoses of the World Health Organisation [12] stated that in the U.S.A. infectious cases of syphilis increased by 15% in 1959 over the preceding year; the disease has, in fact, been on the increase since 1954, and syphilis in all its stages ranks fourth among notifiable diseases in the U.S.A. In recent years increases have been reported also from Finland, France, Italy, and various areas in Africa.

The remarkable outbreak of infectious syphilis in Maryland, described in last week's issue, in which recognition of a single case of syphilis led to the detection of 44 other previously untreated cases, shows that this condition can spread among the promiscuous with epidemic force. One striking feature of this group of cases was the youth of the patients. All but 4 were under 25 years of age and 25 were under 20, a girl of 13 being the youngest. A joint statement from the U.S.A. by the Association of State and Territorial Health Officers, the American Venereal Disease Association, and the American Social Health Association,[13] declares that venereal disease is increasing among teenagers and children. From 1957 to 1958 the number of reported cases of infected children aged 10–14 increased from 2443 to 2793 (14·3%) and of those aged 15–19 from 44,864 to 49,909 (11·4%). Full details for 1959 are not yet known; but 29 States and 21 cities have already reported increases in early syphilis in young people aged 15–19, and 25 States and 43 cities have reported increases in gonorrhœa in the same age-group. There have also been reports of an increase of both diseases among children aged 10–14.

In a symposium at this year's Health Congress of the Royal Society of Health [14] it was stated that evidence collected from 147 clinics for venereal disease in England, Scotland, and Wales showed that new cases of gonorrhœa had increased by 13·8% in 1958 over the total for 1957. By far the biggest increase was in young people aged 18–19. We must be vigilant and continue to strengthen our measures for prevention and control of venereal infections. There is, perhaps, one particular lesson to be learnt from the Maryland experience and from methods in the U.S.A. generally: the more assiduous the efforts to trace contacts, the larger the number of infected persons brought under treatment. Nevertheless the techniques of contact tracing must conform to the outlook of the society in which they are applied; and it is doubtful whether the method of " cluster-testing ", in which not only sex contacts of patients but many other friends and acquaintances who might conceivably have been exposed are investigated, would be acceptable here.

## ANGOR ANIMI AFTER AQUEOUS PROCAINE PENICILLIN

IN 1951 Batchelor et al.[15] described 8 cases in which intramuscular injection of aqueous procaine penicillin was followed by an immediate reaction of which the most striking symptom was anxiety with a conviction of impending death. Björnberg and Selstram [16] have now recorded similar reactions in 33 patients. A constant feature was a conviction of impending death or severe anxiety; and sensory disturbances, such as paræsthesiæ and tactile, visual, and auditory hallucinations, were common, with various degrees of mental confusion. The acute episode lasted for from minutes to an hour, with exhaustion and anxiety persisting for a few days or

8. See *ibid.* Jan. 9, 1960, p. 100.
9. Report of the Ministry of Health for the Year 1957: part II; appendix C, table B; p. 281. H.M. Stationery Office, 1958.
10. Report ofthe Ministry of Health for the Year 1958: part II; appendix C, table B, p. 253. H.M. Stationery Office, 1959.
11. Report of the Ministry of Health for the Year 1957: part II; p. 70. H.M. Stationery Office, 1958.
12. W.H.O. document WHO/VDT/257, Oct. 30, 1959; p. 27.
13. Today's V.D. Control Problem: joint statement by Association of State and Territorial Health Officers. American Venereal Disease Association, and American Social Health Association, February, 1960, p. 16.
14. *Med. Offr*, 1960, **103**, 251.
15. Batchelor, R. C. L., Horne, G. O., Rogerson, H. L. *Lancet*, 1951, ii, 195.
16. Björnberg, A., Selstram, J. *Acta psychiat. Kbh.* 1960, **35**, 129.

occasionally longer. There were no prominent somatic effects, no vasomotor collapse, and no allergic manifestations. Similar but less severe reactions occurred with previous or subsequent injections in some of the patients.

The immediacy of the reaction, and the occasional complaint of a strange taste in the mouth, led both groups of workers to ascribe the reaction to accidental intravenous injection of the aqueous procaine penicillin. This form of reaction is important both because of its alarming nature and its frequency: it apparently develops in about 3 per 1000 injections,[15] and is eighteen times commoner [16] than anaphylactic reactions.

## HEARTBURN

HEARTBURN means to doctors, and to some patients, a burning pain felt anywhere between the xiphisternum and the neck, often worse on lying down and after food. It is often associated with hiatus hernia, duodenal ulcer, or gallstones. Heartburn is believed to arise in the œsophagus from the regurgitation of gastric contents. There has been more discussion of how reflux is prevented [17] than of how it causes symptoms and of whether hiatus-hernia dyspepsia is due purely to œsophageal reflux.

Muscular contraction or artificial distension of the lower part of the œsophagus causes pain similar to heartburn.[18] So also does hydrochloric acid, either by direct action on an inflamed mucosa or by causing muscular spasm. There is evidence that a hiatus hernia produces heartburn only when reflux œsophagitis develops. Thus, heartburn is a feature of the commoner sliding hernia but not of the rarer paraœsophageal or rolling type.[19] In hernia of the rolling type reflux cannot be demonstrated radiologically, but Donnelly [20] was able to show reflux in all sliding herniæ by a careful technique. A few hiatus herniæ—mainly the large paraœsophageal ones—produce no dyspepsia at all,[21] so the hernia itself cannot be the cause of the pain.

In a group of patients with indigestion, Phear [21] found no difference between the symptoms of those showing hiatus hernia with reflux and those in whom reflux alone was demonstrable. Slight intermittent regurgitation is common, and no doubt only persistent reflux causes œsophagitis. Even this may be harmless as in Allison's fortunate patient.[19] Since childhood she had been able to swallow a toffee, sing a hymn, and then bring up the toffee to enjoy at leisure during the sermon; despite fifty years' indulgence in reflux she had no œsophagitis. The degree of œsophagitis may depend on acid and pepsin levels in the œsophageal fluid, though typical reflux dyspepsia may occur with achlorhydria,[22] and heartburn cannot be correlated with hyperacidity.[23]

Heartburn and angina pectoris are referred to similar areas, and the differential diagnosis between these conditions may be difficult. Angina is typically a constricting or pressing sensation closely related to exercise or emotion and relieved by trinitrin. The electrocardiogram (after exercise if necessary) is abnormal in 95% of cases.[24] The pain of hiatus hernia, on the other hand, is worse after meals and on lying or stooping; it is relieved by alkali or belching and spreads to the back. None of these features is completely specific. Moreover, hiatus hernia and ischæmic heart-disease are each found in overweight patients beyond middle age, and both may be present together. Most hiatus-hernia patients with angina have an abnormal electrocardiogram or other objective evidence of ischæmic heart-disease,[21 25] and the improvement in angina after treatment of the hiatus hernia suggests that this disorder may precipitate anginal attacks.[26] In laboratory animals distension of the œsophagus has been shown to decrease coronary blood-flow.[27] Baylis et al.,[28] however, did not find electrocardiographic evidence of myocardial ischæmia during distension of the lower œsophagus in patients with ischæmic heart-disease.

Even more confusing is the severe, lengthy attack of central chest pain caused by a hiatus hernia but clinically indistinguishable from myocardial infarction.[18] There may even be positional changes in the electrocardiogram suggesting posterior infarction; but fever, increases in serum-transaminase or erythrocyte sedimentation-rate, and leucocytosis are absent.

In conclusion, then, the heartburn of a hiatus hernia is caused by œsophageal reflux; a hiatus hernia and angina are often associated, and the hiatus hernia may aggravate angina by reflex coronary vasoconstriction.

## THE OTHER FALLING SICKNESS

No more pleasing prospect could be held before the eyes of most clinicians than that of distinguishing a dangerous but curable condition from clinically similar disorders which are bound to lead to the patient's death. Dramatic as it may sound, this is often the position with subdural hæmatomas, particularly of the chronic variety.[29] A patient, usually elderly, is found to show unexpectedly rapid mental deterioration, or starts to fall repeatedly, or becomes drowsy, or is admitted to hospital with urinary retention. The patient's memory of the recent past is so poor that he cannot recollect it if he has been significantly injured, or indeed if he has a severe headache. Minor pupillary inequality, or minimal pyramidal signs, or papillœdema, or perhaps no neurological abnormality can be elicited. But the pertinacious clinician seeks the radiologist's help or even surgical exploration, and is rewarded by finding one of the few reversible dementias in the book. There is an ineluctable satisfaction in all this.

And yet . . . in this issue we print three papers which must give rise to some thoughtfulness. In the first place, not all treated patients with subdural hæmatoma survive. In the series of Mr. McKissock and his colleagues (p. 1365) the surgical mortality-rate was 6%; but all the fatal cases were in children or persons over the age of 50: in patients over 60 the mortality-rate was 12%. Furthermore they find that of the 179 known survivors 29 (16%) remain partly or totally disabled. Only 3 out of 4 remain well after the illness. Of a small group of 11 cases described by Mr. Davies (p. 1369) 7 were confused postoperatively and 4 remained permanently so; in 1 case Korsakoff's psychosis developed a year later. These grave reminders emphasise that while one factor in the development of subdural hæmatoma may be progressive friability of veins with increasing age, another is atrophy of the brain itself. Compression or distortion results in further vascular and cellular insufficiency, and iatrogenic or inadvertent dehydration may precipitate permanent dementia. Failure

17. *Lancet*, April 16, 1960, p. 862.
18. Dickson, R. C. *Canad. med. Ass. J.* 1960, **82**, 773.
19. Allison, P. R. *Surg. Gynec. Obstet.* 1951, **92**, 419.
20. Donnelly, B. *Brit. J. Radiol.* 1953, **26**, 441.
21. Phear, D. *Lancet*, 1957, i, 708.
22. Alvarez, W. C. Introduction to Gastroenterology. New York, 1948.
23. Bennet, T. I., Ryle, J. A. *Guy's Hosp. Rep.* 1921, **71**, 286.
24. Wood, P., McGregor, M., Whitaker, W. *Brit. Heart J.* 1950, **12**, 363.
25. Master, A. M., Dack, S., Stone, J., Grisham, A. *Arch. Surg.* 1949, **58**, 428.
26. Gilbert, N. C. *Bull. N.Y. Acad. Med.* 1942, **18**, 83.
27. Gilbert, W. C., Leroy, G. V., Fenn, G. K. *Amer. Heart J.* 1940, **20**, 519.
28. Baylis, J. H., Kauntze, R., Trounce, J. R. *Quart. J. Med.* 1955, **24**, 143.
29. *Lancet*, 1959, i, 505.

of the brain to expand may be countered by carefully washing the subdural space, by closing the wound with the head lowered as far as possible towards the floor, and by inserting intrathecal saline—perhaps repeatedly. Nursing for the first few days with the head lowered is also advisable, as gravity is a potent force where pressures are low; and the sitting position is always dangerous in space-occupying lesions over the vertex. McKissock et al. also describe the serious prognosis in acute and subacute hæmatomas. Here the complication of intracerebral hæmatoma is particularly important, and emergency angiography may prove an invaluable diagnostic measure.

Dr. Pygott and Dr. Street (p. 1371) return to the really important positive stage—namely, that of primary diagnostic screening. If this stage breaks down or even is unduly delayed, three cases out of four exchange recovery for death or dementia.

Coma invariably precedes death; but, where medullary herniation occurs, the onset of coma may coincide with respiratory arrest, and may precede cardiac arrest by only seconds or minutes.

Important though it is to be reminded of the symptoms that may arise in this condition, it is even more important to realise the manifestations that may be absent. Herein lies the real significance of these three contributions.

## ACUTE TUBULAR NECROSIS

THE views we lately expressed [1] have been supported by an analysis of 80 cases of acute tubular necrosis. In this study Kiley et al.[2] found that hæmodialysis by a Kolff rotating-drum artificial kidney was necessary in 60% of the cases, clinical rather than biochemical criteria being followed in deciding on this type of treatment. Kiley et al. consider that dialysis is more effective in preventing clinical deterioration than in improving the clinical situation after such deterioration has already occurred. This finding necessitates earlier and more frequent use of the artificial kidney—usually at the first evidence of impaired cerebration from uræmia. The series shows the usual difference in prognosis between the milder medical and obstetric cases and the more serious surgical group. In the patients in whom renal damage was due to nephrotoxic drugs or poisons, transfusion reactions, or complications of pregnancy, the mortality was only 9%; whereas, of the cases secondary to surgical operations or accidental trauma, 65% died.

The duration of the oliguric stage was thought to be of little importance in prognosis; but no case in this series had an oliguric stage lasting longer than twenty-four days. The age of the patient is claimed to be much more important; 15% of patients under the age of 35, compared with 67% over 40, did not survive. This difference may be due partly to the lower average age of the milder medical and obstetrical group. If the cases due to accidental trauma and to surgical operations (excluding a particularly unfavourable elderly group where renal failure was secondary to aneurysmectomy) are considered alone, the fatality-rate was 64% above the age of 40 and 46% below that age—a difference which is not statistically significant. The rate of protein catabolism, computed from the average daily rise of non-protein nitrogen, correlated well with the severity of the extrarenal disease and extent of tissue injury. The figures varied from a rate of 30 g. protein breakdown daily in the least severe cases to 150 g. daily in the patients with serious injuries. The abnormally high catabolic rate in the severe cases could not be controlled either by high carbohydrate intake or by administration of testosterone.

Several other reports [3–5] show that results are now satisfactory in acute tubular necrosis from medical and obstetrical causes, but still unsatisfactory in surgical cases. The first large surgical series was reported by a unit treating acute oliguric renal failure in battle casualties in the Korean war.[6] This series is not, however, comparable to surgical cases in civilian practice. Teschan et al.[6] stated: "The frequency and rapidity of potassium intoxication constitutes the most important difference between the post-traumatic renal insufficiency of combat casualties and the acute renal failure usually seen in civilian practice." They reported that plasma-potassium concentrations of more than 7·0 mEq. per litre were found in a third of patients within the first four days after wounding. This is rare in civilian cases, and it is unusual in most centres operating artificial kidneys to dialyse patients because of hyperkalæmia. High serum-potassium in the military cases always resisted treatment with ion-exchange resins, whereas in civilian cases this therapy is usually effective. Civilian injuries rarely involve large lacerations of voluntary muscle, which are common in injuries from modern high-velocity missiles. The failure of therapy in the civilian surgical cases results from the deleterious effect of the uræmia on tissue repair, and the increased susceptibility to infection. Salisbury [7] first suggested earlier and more frequent dialysis: he recommended dialysis in all cases of acute tubular necrosis on the fifth day of the illness if clinical signs of uræmia were present, and on the sixth day if diuresis had not started. Whilst this seems unnecessary in the medical and obstetrical cases, it is probably advisable in the surgical group. Scribner et al.[8 9] take an even more extreme view, which may well prove to be correct. They have evolved two systems of therapy which they term "prophylactic hæmodialysis" and "continuous hæmodialysis". In the former, hæmodialysis is performed on alternate days in many cases; and in the latter, hæmodialysis has been applied continuously for as long as seventy-two hours. Scribner et al. claim that in the surgical cases treated before these systems were adopted the mortality was 71% of 41 cases—a figure comparable with those of other centres both in this country and the U.S.A. Of 19 similar patients treated by their more heroic methods, only 37% died. The two groups were shown to be comparable in age distribution and severity of injuries and uræmia.

Until recently, centres operating artificial kidneys in this country have not been able to adopt such time-consuming methods, owing to the large number of patients referred for dialysis. But most teaching centres are now equipped for this form of treatment, and with smaller numbers of patients involved there should soon be a gratifying improvement in the present unsatisfactory results in the surgical patients.

1. *Lancet*, Feb. 13, 1960, p. 371.
2. Kiley, J. E., Powers, S. R., Jr., Beebe, R. T. *New Engl. J. Med.* 1960, **262**, 481.
3. Bluemle, L. W., Jr., Webster, J. D., Jr., Elkinton, J. R. *Arch. intern. Med.* 1959, **104**, 180.
4. Parsons, F. M., McCracken, B. H. *Brit. med. J.* 1959, i, 740.
5. Loughridge, L. W., Milne, M. D., Shackman, R., Wootton, I. D. P. *Lancet*, Feb. 13, 1960, p. 351.
6. Teschan, P. E., Post, R. S., Smith, L. H., Jr., Abernathy, R. S., Davis, J. H., Gray, D. M., Howard, J. M., Johnson, K. E., Klopp, E., Mundy, R. L., O'Meara, M. P., Rush, B. F., Jr. *Amer. J. Med.* 1955, **18**, 172.
7. Salisbury, P. F. *Arch. intern. Med.* 1958, **101**, 690.
8. Scribner, B. H., Magid, G. J., Burnell, J. M. *Clin. Res. Proc.* 1960, **8**, 136.
9. Scribner, B. H., Caner, J. E. L. *ibid.* p. 136.

## Special Articles

# ASSUMPTIONS OF HEALTH SERVICE FINANCE

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IN this paper I examine the assumptions on which the financial structure of the National Health Service is based, and put forward an alternative method of financing it.

### INTENTIONS

The Beveridge report of 1942 made assumptions which were to have a profound effect on the service. It proposed the introduction of "a national health service for prevention and for cure of disease and disability, by medical treatment", which was to "be provided where needed".[1] The State was primarily interested "in finding a health service which would diminish disease"[2]; and the cost of providing more elaborate and costly treatment would, it was thought, be offset by "a reduction in the number of cases requiring it".[3] Hence the annual cost of the service (£170 million) was not expected to rise in the twenty years between 1945 and 1965. It might even drop in later years, because the proposed medical service might "affect the possibility of diminishing and controlling sickness and so may affect the finances of the Social Insurance Fund".[4]

In June, 1942, the Medical Planning Commission, composed of members of the medical profession, considered the aims of a future medical service in this country to be "the achievement of positive health, the prevention of disease, and the relief of sickness", made possible by making "available to every individual all necessary medical services".[5] It assumed that such a service could be financed "either by insurance methods or State funds".[6]

The objectives of the National Health Service Act of 1946 were the same as those proposed by Beveridge and the medical profession, and the means of a hieving them were ensured by the financial provisions under section 52. "Any expenses incurred . . . shall be defrayed out of moneys provided by Parliament." [7]

### CHANGES IN PRACTICE

An estimate made at the end of 1947 for the first nine months of the health service, set the annual cost at £179 million. Early in 1949 a supplementary estimate of £53 million caused a heated discussion in Parliament. One member, defending the service, opposed any suggestion for a limited fixed "sum of money which the Minister shall be permitted to expend . . .".[8] Another asked rhetorically: "What does it matter what the figure is if the needs of our people for medical, dental, and hospital treatment which they require call for such a figure?" [9] This argument was countered by a speaker who did not agree "that the need of the people is the only criterion of the amount of money to be spent" [10]; he pointed to the claims of other essential services on limited public funds. Nevertheless, in 1955 the Acton Society Trust still thought it fundamental that the service should be "secured through the provision of national funds based solely on an assessment of needs, in accordance with the recommendation of the Beveridge report".[11]

At the end of 1948 the estimate of the cost to the Exchequer for 1949-50 was £228 million. In early 1950 a supplementary estimate of £98 million outraged the Opposition, who deplored "the failure of the Chancellor of the Exchequer to enforce his own instructions to Departments not to overspend so extensively their Estimates".[12] The reply of the Chancellor, Sir Stafford Cripps, was unequivocal. "I believe it is necessary to call a halt to further development of these services. We must, therefore, regard the Estimates for the forthcoming year as a ceiling beyond which we must not be carried." [13] As part of the policy of applying a ceiling of £400 million on expenditure, the Labour Government in May, 1951, imposed charges for dentures and spectacles. A few months later a Conservative Government came into office, and continued this policy. "We shall keep the cost of this Service . . . within a ceiling of £400 million," [14] said Mr. Butler as Chancellor in January, 1952; but within two months the Danckwerts award made it impossible for the Government to maintain the ceiling, and in 1952-53 expenditure rose to £420 million. *The Times* in February, 1953, remarked that though the principle of an upper limit to health service expenditure was no longer questioned, retention of the same figure became more difficult each year, and quoted Mr. Macleod's words as a backbencher: "We have been committed to a ceiling of £8 a head. There has been no examination . . . to decide whether it should be £7, £8, £10, £11; we do not know. I suggest that . . . we should study the proportion which health ought to bear to the whole of our national expenditure." [15]†

Uneasiness about the cost of the health service persisted, both inside and outside Parliament. Finally, in April, 1953, the Guillebaud Committee was set up "to advise how, in view of the burdens on the Exchequer, a rising charge upon it can be avoided, while providing for the maintenance of an adequate Service".[16] Reporting in 1956, it said that "the National Health Service has absorbed a decreasing proportion of the country's resources since . . . the first full year of the Service",[17] and after an exhaustive examination it "found no opportunity for making recommendations which would . . . reduce in a substantial degree the annual cost of the Service".[18] But the country, even now, has still not recovered from the shock of the large supplementary

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† The national income is a measure of the money value of goods and services becoming available to a nation from economic activity over a period of time. It can be regarded in three ways: as a sum of incomes derived from economic activity (from employment and from profits); as a sum of expenditures (on consumption and on capital formation); or as a sum of the products of the various industries of the nation. Thus, national income = national expenditure = national product.

1. Beveridge Committee. Social Insurance and Allied Services; p. 158. Cmd. 6404. H.M. Stationery Office, 1942.
2. *ibid*. p. 162.
3. *ibid*. p. 105.
4. *ibid*. p. 159.
5. Medical Planning Commission. *Brit. med. J.* 1942, i, 743.
6. *ibid*. p. 746.
7. National Health Service Act. 1946. 9 & 10 Geo. 6, Ch. 81.
8. Messer, F. *Parliamentary Debates: House of Commons*. 1949, 461, col. 1377.
9. Fernyhough, E. *ibid*. col. 1411.
10. Eccles, D. *ibid*. col. 1430.
11. Acton Society Trust. Hospitals and the State; p. 15. London, 1955.
12. Crookshank, H. F. *Parliamentary Debates: House of Commons*. 1950, 472, col. 916.
13. Cripps, S. *ibid*. col. 937.
14. Butler, R. A. *ibid*. 1952, 495, col. 54.
15. Macleod, I. *ibid*. 1952, 498, col. 962.
16. Macleod, I. *ibid*. 1953, 513, col. 1229.
17. Guillebaud Committee. Cost of the National Health Service; p. 10. Cmd. 9663. H.M. Stationery Office, 1956.
18. *ibid*. p. 239.

estimates of the first two years of the Service, and the considerable miscalculations of the health service planners. Despite the Guillebaud report, a myth persists that the service is grossly extravagant.

### FIVE ASSUMPTIONS

These quotations suggest a change after the first year, in the objectives underlying the financing of the service. Initially, public funds were to be supplied to provide medical care, with need as the sole criterion for the quantity of funds to be made available. Within 18 months need was to be satisfied only within the arbitrary limit of £400 million per annum of public funds. This was not a mere shift in emphasis: it was a fundamental change of policy. But both policies are based on false assumptions, and are difficult, if not impossible, to carry out.

The assumptions underlying the service as planned include:

1. *A publicly financed health service, by satisfying need for medical care as it arises, will result in a diminution or control of disease by prevention or cure.*

This is false. Improved medical care, whether privately or publicly financed, will prevent or cure individual diseases in individuals, but it does not control "disease" in any meaningful sense. The pattern of disease in the community changes; "disease" does not diminish or disappear. The child who, because of immunisation, does not die of diphtheria, smallpox or tetanus at the age of three, is cured of tuberculosis at the age of twenty, lives on to be treated for diabetes mellitus at sixty, becomes disabled by osteoarthritis at seventy, and dies at eighty from a cerebral thrombosis.

2. *National expenditure on medical care can be determined by the need for medical care.*

This assumption is not borne out in practice. Observations in many countries suggest that national expenditure on medical care is primarily determined by national income.[19 20] It is quite evident that those nations most in need of medical care—if need be assessed by infant-mortality rate and the expectation of life—have a low per-capita expenditure on medical care, because they have a low per-capita income. Those nations least in need of medical care have a high per-capita expenditure on it.

3. *Since an improved health service will result in improved health and decrease the need for medical care, the cost of such a service after an initial rise will remain static or actually fall. Thus expenditure on a health service can be self-limiting.*

Both basic premises are false. Control or prevention of individual diseases in individuals does not decrease the need for medical care in any absolute sense; and anyhow need does not determine the cost of a health service. Expenditure on a health service is therefore not self-limiting; it is limited by national income and by demands on national income other than those of medical care.

4. *The need for medical care—which often remains unsatisfied when its satisfaction depends on individual direct payments—can be wholly satisfied when payment is made collectively through public funds.*

This could be true only if need was limited in some meaningful way, or if public funds were unlimited. Neither of these propositions is true, and the assumption based on them is false.

With these false assumptions as foundations on which the financial structure of the health service rested, a final assumption was made on which the financial tools of the service were fashioned.

19. Seale, J. R. *Lancet*, 1959, ii, 555.
20. International Labour Office. Cost of Medical Care; p. 152. Geneva, 1959.

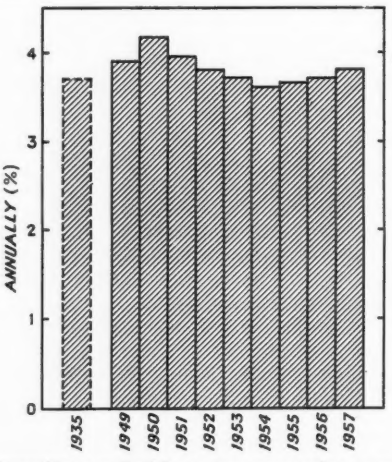


**Fig. 1—Expenditure on health services expressed as a percentage of gross national product, United Kingdom, 1949–57 and 1935.**

*Sources:* 1949–1957, see table. 1935, Political and Economic Planning, *Report on the British Health Services*, London, 1937; p. 387.

Expenditure on items of medical care in 1935 roughly comparable to the present health services was about £163 million.

5. *Public funds can be provided for a health service using an assessment of medical needs as the sole criterion for expenditure.*

This assumption, and all the previous ones, beg the question of what is need for medical care. Does a patient need to be in hospital, or in a convalescent home; does he need a single room; does he need a blood-transfusion; does he need a carotid arteriogram, serum-electrolyte estimations, or an electroencephalogram; does he need an ambulance; does he need a laparotomy; does he need a consultant's opinion; does he need aneurine hydrochloride, delta-hydrocortisone, or tetracycline; does he need a home help; does he need a false tooth? To all these questions, and others like them, on which decisions must be taken daily, there are no answers valid for all people, in all places, at all times. The concept of need for medical care is largely subjective, and it is relative. The answers

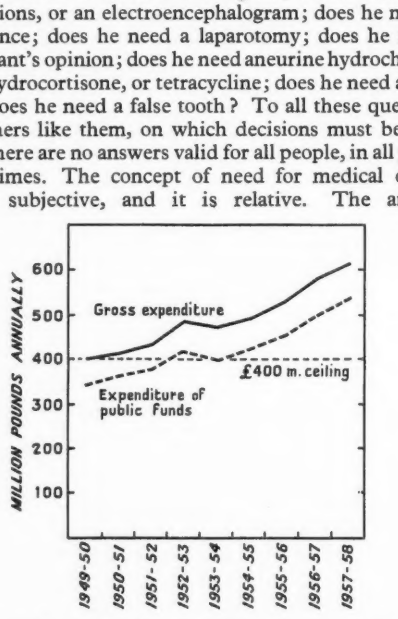


**Fig. 2—Expenditure of public funds and gross expenditure on the National Health Service for England and Wales during 1949–58.**

*Source:* Ministry of Health annual report for 1958, part 1, table 1.

Public funds as used here are those provided by the Exchequer and National Insurance Fund; local-authority funds derived from rates are excluded. The abrupt rise in 1952–53 was due to the Danckwerts award, paid in this year, but including retrospective additions to general practitioners' incomes from 1948–51.

will depend on who is making the decision, when he is making the decision, and where he is making it.

A criterion is a measure or standard. Public funds are easily measured and limited in quantity. To use a concept that is largely subjective and relative—and therefore immeasurable—as the sole criterion, or measure, for assessing the quantity of public funds to be made available is meaningless. Some other criterion must be found.

### EFFECTS OF THESE ASSUMPTIONS

Expenditure on the National Health Service showed the initial rise predicted by the planners. But the subsequent fall which they expected could not take place

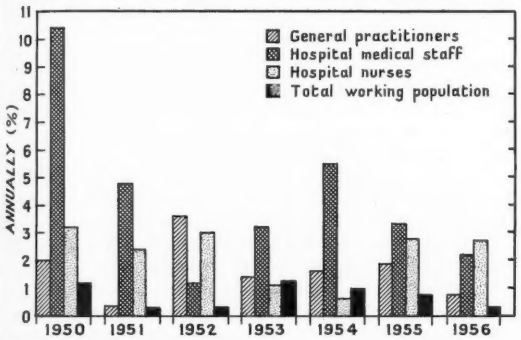


**Fig. 3—Annual percentage rise (over preceding year) of employees in National Health Service (England and Wales) and in the total working population.**

*Sources:* Ministry of Health annual reports; and Central Statistical Office, Monthly Digest of Statistics.

General practitioners include assistants and trainee assistants. Hospital medical staff expressed as whole-time equivalents. Hospital nurses include part-time and student nurses.

so long as the finance of the service was based on the criterion of need.

National expenditure on medical care in Britain rose rapidly between July, 1948, and 1950, not only in actual prices, but also as a proportion of national income. By 1950 the health services' expenditure accounted for 4·2% of gross national product (fig. 1).

It is difficult to assess the proportion of national income spent on medical care in Britain before 1948, because the data are inadequate. In the mid-1930s it was probably about

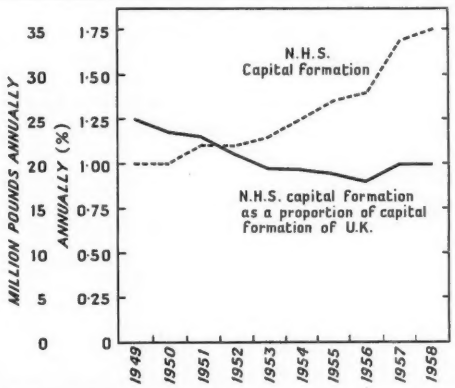


**Fig. 4—Gross fixed capital formation of the health services of United Kingdom, 1949–58.**

*Source:* Central Statistical Office (1959) National Income and Expenditure, tables 47 and 53.

Gross fixed capital formation is all expenditure on buildings, machinery, vehicles, or plant which will give service for more than a year.

3·7%† of gross national product (fig. 1). During the war it probably fell even further in Britain than in the U.S.A. where the ratio was less than 3% in 1943, and where the pre-war ratio was not regained until 1949. Between 1947 and 1950 the ratio rose rapidly in Britain because of the changeover from a war-time to a peace-time economy, because some expenditure had been postponed in expectation of the introduction of the N.H.S., and because of the unusually high earnings during 1948–50 of some of those working for the service, particularly opticians and dentists. All these factors were temporary, but even before they had ceased to be relevant the service was being financed on an entirely new assumption.

When the increasing drain on public funds alarmed politicians and taxpayers, a limit was placed on the quantity of funds provided. The fifth assumption was in practice replaced by a new one:

> 6. *National expenditure on medical care in a modern industrial State can be limited to a constant cash figure over many years by political decision, without adversely affecting the quality of the care provided.*

This assumption would be reasonable if the first four

† This proportion is only a rough indication of pre-war expenditure; it is certainly not directly comparable to the other proportions given in fig. 1, which are themselves internally consistent.

GROSS EXPENDITURE OF PUBLIC HEALTH SERVICES—UNITED KINGDOM 1949-1957 (MILLION POUNDS)

| Year | Central government | | Local authorities | | | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| | 1 Current expenditure on goods and services | 2 Gross fixed capital formation | 3 Current expenditure on goods and services | 4 Gross fixed capital formation | 5 School health service | Expenditure by patients on N.H.S. charges | Gross expenditure on health services | Gross national product | Ratio of health services' expenditure to gross national product |
| 1949 | 369 | 12 | 44 | 3 | 6 | 3 | 437 | 11,129 | 3·90 |
| 1950 | 414 | 13 | 44 | 3 | 7 | 3 | 484 | 11,687 | 4·15 |
| 1951 | 427 | 14 | 49 | 3 | 7 | 8 | 508 | 12,839 | 3·95 |
| 1952 | 436 | 13 | 53 | 3 | 8 | 20 | 533 | 13,987 | 3·80 |
| 1953 | 450 | 14 | 55 | 3 | 8 | 24 | 554 | 14,922 | 3·70 |
| 1954 | 464 | 16 | 57 | 3 | 9 | 25 | 574 | 15,945 | 3·60 |
| 1955 | 499 | 18 | 62 | 3 | 10 | 26 | 618 | 16,892 | 3·65 |
| 1956 | 549 | 18 | 68 | 3 | 11 | 28 | 677 | 18,267 | 3·70 |
| 1957 | 591 | 24 | 73 | 3 | 12 | 32 | 735 | 19,370 | 3·80 |

*Sources:*
Column 1 Central Statistical Office (1959). National Income & Expenditure, table 35.
" 2 *ibid.* table 36.
" 3 *ibid.* table 38.
" 4 *ibid.* table 39.
" 5 Central Statistical Office, Monthly Digest of Statistics, May, 1959, table D.
" 6 *ibid.* table B.
(In the Monthly Digest, expenditure is given by the financial year. It has been assumed here that this was the same as in the earlier calendar year.)
" 8 Central Statistical Office (1959). National Income & Expenditure, table 1.
See also Central Statistical Office (1956). National Income Statistics. Sources and Methods; p. 257.

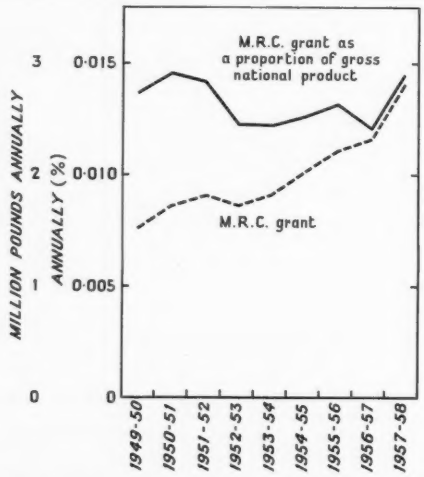


**Fig. 5—Medical Research Council grant from the Central Government, 1949–58.**

*Source:* Central Statistical Office, Monthly Digest of Statistics, May, 1959, table B.

It has been assumed that gross national product was the same in the financial year as in the calendar year.

were true: but they were not. (Many people still regard them as sound and attribute their failure to be realised to some defect in the working of the service or in medical practice. Such people talk of "our National Ill-health Service", or the necessity for "positive health and a preventive approach to medicine", or the "paradox" of health-service costs rising while indices of national health improve.) It would be reasonable if the proportion of the working population providing medical care decreased with medical advance and industrial development: but it does not—indeed the reverse is true. It would be reasonable if national income remained static; but if national income rises, whether because of inflation, increased productivity, or an increased working population, then the greater the rise, the greater the unreasonableness of the assumption.

The gross national product in the United Kingdom rose from £11,687 million in 1950 to £19,370 million in 1957—a rise of 67%. If total expenditure by the National Health Service was £400 million in 1950 and had remained the same

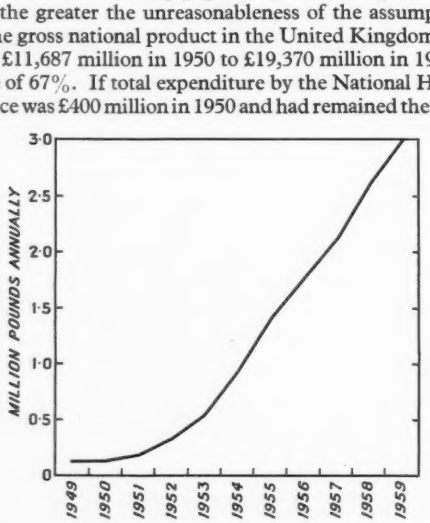


**Fig. 6—Gross annual income of British United Provident Association, 1949–59 (year ending June).**

Data given in an article in the *Financial Times* (Dec. 8, 1958) suggest that over three-quarters of private medical care insurance in Great Britain is handled by B.U.P.A.

in 1957, the percentage of the gross national product spent on medical care would have fallen by some 40%—from 3.45% to 2.05%. Such a fall in peace-time would be contrary to the experience of other nations throughout the world.

### EFFECTS OF THE SIXTH ASSUMPTION

If, in a health service which is State-operated and financed, and practically a monopoly supplier of medical care, expenditure is limited for some years to a constant figure while national income rises by two-thirds, one would expect the following consequences:

A. The attempt would fail. Such intolerable strains would be produced within the service that it would be considered politically more desirable to let expenditure rise than to keep within the limit.

Fig. 2 shows that expenditure of public funds on the National Health Service in England and Wales, and the gross cost, has in point of fact risen annually since 1950 (after the abnormal effects of the Danckwerts award in 1952-53 have been discounted).

B. The proportion of national income devoted to medical care would fall. The more it fell, the greater the difficulty in making it fall further; and the lower the level reached, the greater the difficulty in maintaining it. In due course the proportion would be expected to rise again.

The table shows expenditure on the health services in the United Kingdom, and the gross national product, since 1949. Fig. 1 shows the former expressed as a percentage of the latter. After a rapid fall from 1950 to 1954, this percentage has risen slowly.

C. In so far as the attempt was successful, the number of people employed by the service would fall, relative to the rest of the working population; or their incomes would fall, relative to the incomes of the rest of the working population; or capital expenditure would fall, relative to the rest of the economy.

The number of NHS employees, relative to the rest of the working population, seems to be rising rather than falling (fig. 3). Since 1949 the average incomes of some categories of employees have fallen, relative to the average incomes of other workers. From 1949 to 1956 capital expenditure on the health services, as a percentage of all capital expenditure by the nation, fell steadily (fig. 4).

D. Medical research would be starved of funds.

The share of the national income received by the Medical Research Council fell substantially between 1950 and 1956 (fig. 5).

E. The flow of funds from private sources outside the State service would increase.

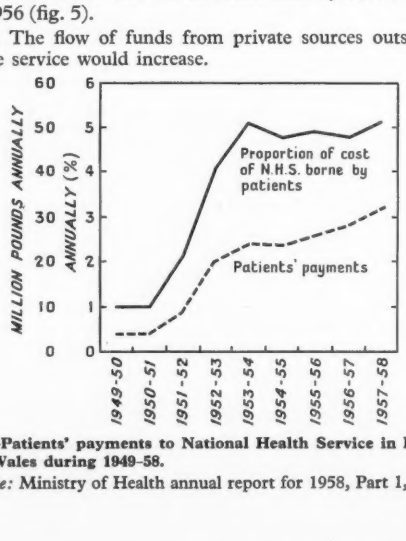


**Fig. 7—Patients' payments to National Health Service in England and Wales during 1949–58.**

*Source:* Ministry of Health annual report for 1958, Part 1, table I.

Health insurance provided by the British United Provident Association is on a relatively small scale, but the Association's gross income increased twenty-three times between 1950 and 1959 (fig. 6).

F. The proportion of the cost of the health service borne by direct patient payments would increase.

Fig. 7 shows that the proportion of the cost of the service borne by direct payments by patients rose from 1% in 1949 to 5% in 1953 and has since remained at that level.

### ASSUMPTIONS FOR THE FUTURE

Many of the basic financial assumptions of the National Health Service as planned, and as operated so far, are pragmatically unsound: they do not work. For the future more realistic assumptions are needed.

I suggest that the objectives should be:

*The best medical care that the nation can afford—not the cheapest it can get.*

*A service primarily financed by taxation or by insurance.*

If I am right in my observation [19] that, in the absence of major wars or economic depressions, the proportion of national income devoted to medical care tends to remain constant over many years, whether it is publicly or privately financed, a method of financing a health service could be evolved as follows:

*Determine by political decision the range of services to be provided free of direct charge.*

*Determine the percentage of national income these services had absorbed over the preceding ten to twenty years.*

*Determine by political decision the public funds to be provided for the health service for the next five years or so, as a percentage of national income.*

This percentage would be a " ceiling " beyond which public funds would not rise; a " floor " below which they would not fall; and it would recognise the fact that the " building " itself has a tendency to expand. Need for medical care could then be satisfied within these limits, on a priority basis, as effectively as human fallibility would allow.

A health service based on these assumptions would be financed and administered differently from our present one. But the National Health Service, after all, is nothing more than an organisation for financing and administering medical care. It is not the medical care itself, though the quality of the medical care can be adversely or favourably affected by the financial and administrative system. New assumptions imply, therefore, a new health service, and maybe a better one.

## SUPPLEMENT TO ROYAL COMMISSION'S REPORT

THE Royal Commission on Doctors' and Dentists' Remuneration, which reported four months ago,[1] in its inquiries sent a postal questionary to doctors, dentists, and members of other professions. A further statistical appendix, now published,[2] sets out data from this survey which the Royal Commission considered to be less directly connected with its task but still of great interest in a study of remuneration and conditions of service in the major professions.

1. Royal Commission on Doctors' and Dentists' Remuneration 1957–60. Cmnd. 939. H.M. Stationery Office, 1960. See *Lancet*, Feb. 20, 1960, pp. 421, 427.
2. Royal Commission on Doctors' and Dentists' Remuneration 1957–60. Supplement to report: further statistical appendix. H.M. Stationery Office, 1960. Pp. 42. 2*s*. 6*d*.

# Points of View

## FROM BOTH ENDS OF THE TABLE

### (or The Art of Surgeon Management and Anæsthetist Toleration)

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CONSULTANT ORTHOPÆDIC SURGEON, DARTFORD GROUP OF HOSPITALS

THE partnership between surgeon and anæsthetist is unusual and important. There has been a great change in this relationship of recent years, from that of the surgeon and his lackey to that of the anæsthetist depicted in a cartoon as boasting on the doorstep of a hospital as to the number of surgeons he has working for him. Neither of these two extremes represents the true surgeon-anæsthetist relationship, and as in so many other human relationships the middle way represents what is best for all.

The art of understanding people was described by Ezekiel in the words " I sat where they sat ". Having been an anæsthetist first and then a surgeon later, and having seen the foibles of the surgeons from the anæsthetist's stool, and the idiosyncrasies of the anæsthetists from the surgeon's end of the table, the development of this partnership may be helped by relating some experiences and reactions of both the anæsthetist and the surgeon.

### THE ANÆSTHETIST'S VIEW

First, then, the anæsthetist's view of the surgeon. This view has varied in the past from that of a cringing slave or fawning sycophant to that of a condescending and rather superior technician. The anæsthetist has always been regarded as a junior partner and has tended to look up to the surgeon, and this has perhaps made him at times jealous of his own preserves, tending to resent any intrusion into those regions that he has rightly looked on as his own.

The place that the anæsthetist rightly claims as his own is the anæsthetic room. The anæsthetic room is the anæsthetist's very, very own, and the surgeon must not intrude therein. The surgeon should realise that delay in the anæsthetic room is due to troubles that only the anæsthetist can manage and overcome. The anæsthetist is not spending a long time in the anæsthetic room just to annoy the surgeon and any attempt by the surgeon to hurry him up by peering through the door, or even shouting through the key-hole, only arouses those natural obstinacies which the anæsthetist, being human, is heir to, and, far from being quicker under these circumstances, he may even take longer than ever. The surgeon should always remember that the anæsthetist is king in the ante-room even if he has to surrender his sovereignty on wheeling his patient into the royal presence next door. Finally it should be pointed out to surgeons that to burst into the anæsthetic room and talk in a loud voice or to handle the patient as he is being gently and carefully launched on to the waters of Lethe by the priest of the cult, is just plain bad manners. It is also rather a thoughtless interference with the anæsthetist's most precious possession—his short and tenuous hold on the doctor-patient relationship. The surgeon enters fully and freely into this most precious facet of Medicine. I used to feel acutely in my anæsthetic days the loss of personal relationship between the doctor and his patient, and only the brief interlude in the anæsthetic room takes the place of the relationship which my colleagues used to enjoy. The

fact that so many anæsthetists are seeking closer relationships with their patients by visiting them both before and after the operation in the wards is one of the most pleasing developments in the art of anæsthetics. The anæsthetist is often presented in the anæsthetic room with a frightened stranger whom he has to help through the most important crisis in his life, and it is his privilege to employ his art and skill to make this experience, from the patient's point of view, a brief and pleasant personal relationship. The anæsthetic room was devised as a means to spare the patient the ordeal of waiting in the operating-theatre; but the complexity of modern anæsthetics, with the multiplicity of syringes to be filled and apparatus to be adjusted, is such that an ante-room to the anæsthetic room is sometimes needed. The anæsthetic room should be like the room depicted by John Bunyan: " The pilgrims they laid in a large upper chamber, whose window opened towards the sun rising; the name of the chamber was Peace ".

Partnership is news. The idea of partnership between races, partnership in industry, partnership between individuals, is commonplace in this modern world; and yet the importance of being able to get on with other people underlies the whole story of mankind. The Book of *Proverbs* says: " He that walketh with wise men shall be wise; but a companion of fools shall be destroyed ", and there is wisdom in the advice that a partnership between two people should be the right kind of partnership in order to succeed.

Once the doors of the anæsthetic room are opened, the anæsthetist's brief reign is almost over. He is, however, still responsible for the patient until the surgeon begins the operation, and nothing pleases the anæsthetist more than to be asked by the surgeon for permission to begin —unless it is the few words of thanks at the end of the operation. Once the operation has commenced, of course, the aim of the anæsthetist in his relationship with the surgeon is to make himself obscure and almost unobserved. In order to do this he must be left to mind his own business, which is the administration of the anæsthetic. The surgical dilettante who " gave anæsthetics as a houseman " and who interferes with the anæsthetist is just a menace. A joint consultation beforehand is desirable and even essential, but a quarrel in the theatre is a disaster.

### THE SURGEON'S VIEW

Now for the surgeon's view of the anæsthetist. Operative surgery is a very exacting occupation, and it can be a very nerve-racking affair for the surgeon. From my anæsthetist's stool at the head of the table I often used to wonder why it was that when the surgeon got into difficulty during an operation, he used to pour with sweat whilst all his assistants remained cool and dry. Now I know. It has to be experienced to be believed. The nervous strain of long operating-lists can be very great, and nothing makes things worse than to have to pound up and down the theatre floor, gowned and gloved, waiting for the patient to come in. This is especially aggravating when a list of short cases is presented, because the rhythm of going from one to the other evenly and smoothly is much less tiring when there are no frustrating delays in between each case.

The old anæsthetists of the rag-and-bottle era, whilst having their Herculean struggles in the anæsthetic room, did pride themselves on their ability to get the next patient on the table as the former one was being lifted off. The modern anæsthetist of the " kick him, he is still breathing " era, whilst producing for us beautifully quiet and relaxed anæsthesia of almost unbelievable safety, does seem to take an unconscionable long time about it in the anæsthetic room, and, by Jove, it can be frustrating!

Again, from my anæsthetist's stool I used to wonder why surgeons were often taciturn in the theatre. Now I know. It is because the concentration required of surgeons is beyond the comprehension of those who have not experienced the strain of long and complicated operations. To have the train of thought broken by idle chatter whilst following the steps of a complex operative procedure is nearly grounds for justifiable homicide. I can remember on one occasion, when I was approaching the climax of a very long and technically very difficult operation, the anæsthetist said in a loud voice from the other end of the table: " How on earth is the patient ever going to walk again? ". I had a heavy orthopædic hammer in my hand at the time, and it was only the fear of the great deterrent that prevented the hammer being applied to something other than the head of the osteotome. The good anæsthetist knows when to talk and when to be silent. He should talk when the surgeon wants to relax, and he must keep quiet when the surgeon wants to concentrate. He should never ask the surgeon what he is trying to do when the surgeon is obviously oblivious to everything except the nerve-root or the venous plexus that he durst not tear. The anæsthetist should try to understand that when the surgeon talks aloud and asks his advice during a difficult operation as to what he should do, he is only expecting the anæsthetist to agree with him and give him his support, not to argue about things beyond his ken.

The ideal anæsthetist in the eyes of an anæsthetist is probably an expert technician, but in the eyes of the surgeon he is much more. He is a doctor, possessed of almost feminine intuition as to the surgeon's feelings, and with an ability to sum up the patient's condition and render a physiological balance-sheet at any stage of the operation. This ability is beyond that of the mere technician, and the surgeon still recognises a man with a " flair for anæsthetics ".

It might well be asked how such divergent characters as surgeons and anæsthetists could possibly get on with each other and cooperate in the welfare of the patient. Yet the medical profession is full of such partnerships, often of widely differing personalities, yet both combining in the interests of the patient to work together for his and their own good.

The secret of success in this partnership is mutual understanding, each the result of close prior consultation with the other and of longstanding cooperation in many situations. The anæsthetist should learn the ways of his surgical colleague and should know enough of what is going on at the other end of the table to help in an unobtrusive way both by his skill and understanding as the various steps of the operation proceed. The patient who kicks at the first application of the surgeon's scalpel to his foot can be as dangerous as the anæsthetist who talks at the wrong moment or who fails to talk at the right moment. The surgeon never likes to be left alone in the theatre, and the prophets who foresee anæsthesia by automation and remote control have never known the feeling of confidence engendered in the theatre by a good anæsthetist.

Then again, the anæsthetist should always remember that the patient is primarily the surgeon's patient. He it is who saw the patient in the outpatient department and perhaps persuaded him and his anxious relatives that he should undergo the operation. He it is who has promised him that all will be well, that he will feel no pain, and that Dr. A is a good anæsthetist in whom he has every confidence. He it is who must see the patient and relations if anything goes wrong. The surgeon carries the burden of his patients before, during, and after the operation. The surgeon has come to know his patient as a person of individual worth and infinite value to his family circle.

The anæsthetist shares in this by being what all good anæsthetists should be—a good doctor. The visit to the patient beforehand, and advice to the surgeon on fitness for operating, halves the immediate burden of decision. The mere technician or experimental physiologist whose idea of the doctor-patient relationship is a curt "hold out your arm" in the anæsthetic room increases this burden no matter how skilful he may be in his anæsthetic technique. Then again, the anæsthetist, wise and experienced in resuscitation and the management of theatre routine, greatly reduces the load of anxiety in the operating-theatre. The occasional minor crises, from a nurse fainting to a compressed-air cylinder not working, can all be overcome by the watchful anæsthetist whilst the surgeon pursues his way unmolested. Then, when the tension is over, or whilst awaiting an X-ray film, the good conversationalist is a most pleasant person to have as a barb to one's wit or just as "someone to talk to".

Finally there is that most pleasant of all occasions—tea in the surgeon's room (4*d*. per head these days)—presided over by the anæsthetist whilst his tired colleague relaxes in the chair. What utter bliss!

PARTNERSHIP

The rise of the anæsthetic specialist from the chloroformist of old to his present position of equality is one of the most striking events in modern medicine. The most recent developments in surgery and anæsthesia have produced a far closer relationship than ever before between surgeon and anæsthetist, and there is no doubt that the position of the anæsthetist is well established and secure. There are still those who grudge him his newfound eminence and his economic parity. Is he really worth it? Well, let him be skilled in his trade, be kind and considerate both to his patients and to his colleagues, be unobtrusive when not wanted and plainly evident when he is needed. Let him be guide, philosopher, and friend to all in the theatre, reliable and helpful in the welfare of the patient in all phases of his surgical treatment, and in short let him be a good doctor—then he is worth his weight in gold, and that in some instances is a considerable amount.

As Paul said of the runaway slave Onesimus: "that thou shouldest receive him for ever; not now as a servant, but above a servant, a brother beloved".

## Medicine and the Law

### Deterioration and Institutional Environment

THE parties were married in 1942. From 1946 the wife showed signs of mental instability. She evinced a pathological dread of contamination. The matrimonial home had to be changed several times because of the wife's attitude to her environment and her fear of contact. In 1947, after the birth of a child, her condition improved for a time and then deteriorated. She threatened to commit suicide more than once. In March, 1951, she attempted to gas herself. She survived but killed her child. In May, 1951, she was tried for murder and found guilty but insane. On June 1, 1951, she was admitted to Broadmoor where she had been detained as a patient ever since.

In October, 1959, the husband sought dissolution of the marriage on the ground that the wife was incurably of unsound mind. The official solicitor, as guardian ad litem of the wife, denied that she was incurably of unsound mind.

At the hearing, Dr. P. G. McGrath, physician-superintendent at Broadmoor, said that the wife had severe, chronic, obsessive, compulsive psychoneurosis. A prefrontal leucotomy in 1950 had alleviated her distress, but severe intracranial hæmorrhage had supervened, resulting in severe epilepsy, and personality changes had taken place evidenced by a pathological preoccupation with her bodily functions and gross deterioration in her habits. She had been under his care since 1956 and, despite every known form of treatment, was showing slow but steady deterioration. She was incapable of living independently outside hospital. Without professional aid and supervision she would find the complexity of life intolerable and might well again become depressed to the point of suicide. She was incurably of unsound mind. Dr. J. L. F. Maine, the senior registrar at Broadmoor, confirmed Dr. McGrath's evidence.

Dr. Joshua Bierer, who had examined the wife once in February, 1960, accepted the diagnosis of Dr. McGrath and Dr. Maine, but could not accept their evidence as to deterioration since he held that such a degree of deterioration must entail a deterioration in rationality and he could find none. He said that the right treatment necessitated her release from hospital: she had paid her debt to society and would have a much better chance of recovery if she lived outside an institution. Although he had reported that the wife had never been, and never was, likely to be a danger to anybody, he was not prepared to advance the opinion that if the wife were released from an institution all her symptoms would disappear, but that there was a good chance of her improving to a point at which she would be able to manage her own life and affairs. He also said that the prolonged opportunity of Dr. McGrath and Dr. Maine for observing the wife's obsessions, so far from adding to the value of their opinions, might well be a disadvantage, in that doctors who work in institutions could not help seeing things from a definite angle and their outlook was unconsciously coloured by their environment.

Mr. Justice COLLINGWOOD said that Dr. Bierer's theory that the wife's present condition only needed freedom from institutional life to alleviate it seemed hardly consistent with the history of the case. Before her reception as a Broadmoor patient there was a long history of mental disorder, necessitating electric shock treatment on two occasions followed by leucotomy and culminating in the killing of the child. In those circumstances it was difficult to conceive that the institutional environment had had a detrimental effect on her. Dr. McGrath entirely rejected that theory and doubted whether institutional neurosis existed at Broadmoor. In his opinion the treatment she had received had done a great deal in that it had retarded her deterioration. Having regard to the circumstances leading to the wife's becoming a Broadmoor patient, it was difficult to understand the opinion expressed in Dr. Bierer's report that she had never been a danger to anybody and his prognosis must be considered in the light of that opinion.

His Lordship could find no good reason in the evidence before him for rejecting the view of Dr. McGrath that the wife was incurably of unsound mind since she was not in, nor could she hope to be restored to, a state in which she would be capable of managing herself or her affairs. The husband was, therefore, entitled to a decree in the exercise of the court's discretion.

De Wolf *v.* De Wolf—*Probate Divorce and Admiralty Division:* Collingwood, J., June 2, 1960. John Mortimer (Bernard W. Main); R. B. Holroyd Pearce (the Official Solicitor).

ELAINE JONES
Barrister-at-Law.

# Congresses

## CLINICAL PATHOLOGY

THE fourth International Congress of Clinical Pathology was held in Madrid on June 13–17. More than four hundred pathologists from 36 different countries were present. A few of the contributions are summarised here.

### Immunohæmatology

Dr. J. MOULINIER (Bordeaux) discussed the antigenic structure of platelets and its possible role in the ætiology of disease. It had been shown that platelets shared ABO, Rh, Kell, and Duffy antigens with erythrocytes—which accounted for the rare purpuric syndrome that sometimes complicated hæmolytic disease of the newborn. By applying differential agglutination techniques it would be possible to study the survival of transfused platelets. Platelets also possessed their own specific antigens by which they could be classified into two main antigenic groups—"Duzo" and "Ziv". These specific antigens could be responsible for anti-platelet immunisation after transfusion nullifying the effect of transfusion of concentrated platelet suspensions, and making it necessary to cross-match donor platelets with recipient's serum before transfusion; fœto-maternal platelet incompatibility could also occur, giving rise to neonatal immunological purpura. In more than 70% of cases of idiopathic thrombocytopenic purpura it could be shown that the platelets were coated with globulin, which Dr. Moulinier considered was auto-antibody globulin and which was responsible for the thrombocytopenia. Demonstration of the presence of this globulin on the platelets in patients with idiopathic thrombocytopenic purpura was an indication for splenectomy provided that purpura secondary to lupus erythematosus had been confidently excluded.

### Mycobacterium Lepræ

Prof. C. E. LUMSDEN (Leeds) reviewed various methods for culturing *Mycobacterium lepræ* and gave an account of his experiments in cultivating the organism in animal and human tissue cultures. He found that it could be propagated only with difficulty and with notably inconsistent results in all the human and animal tissues used except cultures of Schwann cells, which selectively took up the organism, which then multiplied intracellularly for a short time. The bacilli remained morphologically unaltered in the Schwann cells for some 39 days, in contrast to their rapid degeneration extracellularly or intracellularly in other tissue cultures. Only a small fraction of the bacilli in a patient's skin might be viable at the time of biopsy.

### Staphylococcal Enzymes

Dr. MARY BARBER (London) gave an account of the enzymes of the staphylococcus, study of which might be helpful in differentiating pathogenic from non-pathogenic strains of the organism. Of these the most useful from the point of view of laboratory differentiation was coagulase. Free coagulase, to which she confined her remarks, was antigenic, and that from different staphylococci of human origin could be divided into three antigenic types corresponding to the three main phage groups. Most normal people had antibodies to one or more types of coagulase. There was no correlation between enzyme production by a strain and its virulence. Penicillinase production by staphylococci was greatly increased by the presence of penicillin, but penicillinase production could not be evoked by growing penicillin-sensitive staphylococci in the presence of penicillin. Penicillinase-producing strains of staphylococci continued to produce the enzyme after passage for long periods in the absence of penicillin, although many strains tended to yield a proportion of cells which had completely lost this capacity.

### Tumour Enzymes

Dr. G. VAN RIJSSEL and Dr. R. J. G. WILLIGHAGEN (Leyden) had examined the enzyme content of 300 human tumours. They found that several tumours had a characteristic enzyme pattern, which was reproduced in their metastases. These workers had identified tumours of unknown origin by determining their enzyme pattern. The pattern seemed to vary according to the degree of differentiation of the tumour tissue, which might indicate the degree of malignancy and the clinical prognosis.

### Uptake of Triiodothyronine by Red Cells

Dr. C. T. C. CHOW and Dr. O. B. HUNTER (Washington, U.S.A.) presented the results of their studies of the uptake of *l*-triiodothyronine tagged with $^{131}I$ by the red cells of 100 normal newborn infants. They found that the uptake was 20–30% with no significant sex difference. The test was performed in vitro on only 3 ml. blood, thus eliminating any radiation risk to the patients and the necessity for large quantities of blood. Other workers had shown that radio-triiodothyronine uptake by red cells was a valuable indication of thyroid function in adults; and this might provide a useful, comparatively simple screening-test for hypothyroidism at birth, especially in endemic areas.

### V.M.A. Excretion

Dr. M. SANDLER and Dr. C. R. J. RUTHVEN (London) described their experience in measuring the urinary excretion of 3-methoxy-4-hydroxymandelic acid (V.M.A.) in patients suspected of having a phæochromocytoma. V.M.A. had been identified as a major metabolite of adrenaline and noradrenaline. Its excretion was increased in every patient with histologically confirmed phæochromocytoma whom they had investigated. One patient, suspected clinically of having a phæochromocytoma, who had a normal urinary catecholamine excretion, had a raised V.M.A. output and was found at laparotomy to have such a tumour. Patients with essential hypertension and raised urinary catecholamine excretion had normal V.M.A. excretion. Some patients with carcinoid tumours had been shown to have raised V.M.A. excretion.

### Plasma-insulin

Dr. J. L. R. CANDELA (Madrid) reviewed the usefulness of estimations of insulin in plasma. From the clinical point of view the estimation permitted the certain diagnosis of hyperinsulinæmic hypoglycæmia due to insulin-secreting adenomas of the islet cells of the pancreas. Furthermore, useful information could be obtained concerning the ætiology of abortions, fœtal malformations, and macrosomia associated with abnormalities of insulin metabolism. Application of this technique to physiological preparations would help to clarify the site in the muscle cell at which insulin exerted its action. It was likely, and very interesting, that muscular and adipose tissue responded in different ways to different fractions of circulating insulin, especially to insulin combined with plasma-proteins. A great deal of work remained to be done to solve the many problems posed by the insulin-effect of plasma. The preparation of the patient on whom the test was to be done was important. Thus blood for the estimation should be drawn with the patient fasting and after a good night's rest, and without any emotional disturbance. If a normal result was obtained in a patient strongly suspected of having an insulin-secreting adenoma, the test should be repeated by collecting blood 5–15 minutes after an intravenous injection of 20 ml. of hypertonic glucose solution. It was most important in such cases to collect the blood during the period of hyperglycæmia.

Heparinised plasma was used for the test. He employed the rat-diaphragm technique; and he emphasised the importance of the preparation of the rats.

### Urinary Œstrogen

Dr. C. HENSGHEM and Dr. G. CESSION (Liège) reviewed the results of urinary œstrogen determinations. They commended the Brown and Beruld method of estimation but pointed out that it was considered by many workers to be too elaborate for routine use, for which the methods of Jayle were more suitable even if less precise. For the purpose of clinical diagnosis there were three possibilities: first, to determine the urinary excretion of endogenous œstrogen; second, to determine the urinary œstrogen excretion after stimulation of the ovary or testis by giving gonadotrophic hormones; and third, to study the urinary œstrogen excretion after administration of œstrone or β-œstradiol. Urinary excretion of endogenous œstrogens gave information about changes in ovarian activity during the menstrual cycle and pregnancy, and reflected abnormalities in ovarian function which could be of diagnostic, therapeutic, and prognostic significance. The effect on urinary œstrogen excretion of stimulation of the ovaries by gonadotrophin gave interesting information in patients with sterility, primary amenorrhœa, or repeated abortions. In men, study of urinary œstrogen excretion after stimulation of the testis with gonadotrophin was helpful in elucidating the ætiology of sexual immaturity, eunuchoidism, and the Klinefelter syndrome; but such tests could be dangerous. Finally the adrenocortical contribution to œstrogen excretion could be assessed by giving radioactively labelled œstrogen and determining the proportion of tagged to normal œstrogen excreted in the urine. This technique had demonstrated differences in œstrogen metabolism between the newborn and the adult.

### Diagnosis of Hepatic Disease

Dr. F. WUHRMANN and Dr. B. JASINSKI (Zurich) reviewed the metabolism of iron-protein complexes and various enzymes in hepatic disease. The iron-protein complex could be differentiated into "function proteins", depot proteins, and transport proteins. Of these the last two were particularly affected in liver disease. Damage to the liver cells caused loss of hepatic intracellular iron, because the cell's capacity for retaining iron was impaired. Serum-iron levels increased, and other intracellular substances, such as enzymes and vitamin $B_{12}$, left the liver cells and appeared in the blood. Cæruloplasmin, which was one of the $\alpha_2$-globulins, was decreased, and this was generally accompanied by low serum-copper levels in hepatolenticular degeneration. Serum-enzyme concentrations rose in liver disease before any alteration could be detected in serum proteins or bilirubin. Such increases of enzymes were an indication of activity of the disease process, and serial estimations in the course of the disease were valuable prognostically. In infective hepatitis the heterogeneous γ-globulins of the serum increased while serum-albumin fell. Serum iron-binding capacity was often completely saturated, and the serum-iron was increased in 90% of cases. Increased enzyme activity was usually accompanied by a rise in serum-vitamin-$B_{12}$. In contrast, in obstructive jaundice, especially in the early stages, there was little or no alteration in serum-protein levels, serum-iron was low, and serum-alkaline-phosphatase alone of the enzymes was increased. There were only minor fluctuations in serum-γ-globulins in fatty degeneration of the liver. In alcoholic cirrhosis there was often a precedent fatty change, and in some cases serum-transaminase and aldolase were increased. In late stages of the disease serum-albumin fell and γ-globulins increased. In biliary cirrhosis unexplained hyperproteinæmia could occur, and there was much increase of $\alpha_2$-globulins. In the congested liver of cardiac failure, where increased γ-globulinæmia was often associated with a normal erythrocyte-sedimentation rate, the alterations in serum-proteins were often reversible. For differential diagnosis of liver disease these workers recommended estimations of serum-iron and of serum-alkaline-phosphatase; but they stressed the great importance of careful history-taking and clinical examination, to which laboratory tests could only be occasionally useful adjuncts.

Prof. N. F. MACLAGAN (London) read a paper on the efficiency of some popular tests in the diagnosis of hepatic disease. Quantitative estimations of bilirubin and urobilinogen were of most value in differentiating prehepatic jaundice from other varieties. Confirmation of a diagnosis of prehepatic jaundice depended on hæmatological tests and red-cell-survival estimations using erythrocytes tagged with radioactive chromium. The most difficult task was to distinguish hepatic from posthepatic jaundice, and to this end a multitude of flocculation tests and enzyme determinations had been devised. Statistical analysis of the value of individual tests, or of certain tests in combination, was too complicated for routine application; and he had evolved a "diagnostic efficiency index" (D.E.I.) by which to assess the usefulness of certain tests in common use. The D.E.I. was calculated as the means of the percentages of results of any test, alone or in combination with another, which gave correct positive and negative results in hepatic and posthepatic jaundice. It represented the percentage probability of correct diagnosis in a case randomly chosen from a mixed group consisting of equal numbers of hepatic and posthepatic cases. A test whose D.E.I. was 50% or less was diagnostically useless; while one with a D.E.I. of 100% would be the perfect test, though such a one had not yet been devised. He listed 6 single tests with D.E.I.s of 75–87% of which cephalin-cholesterol flocculation, thymol flocculation, and serum-alkaline-phosphatase estimation had D.E.I.s of 80%, 85%, and 87% respectively; the D.E.I. of thymol flocculation and serum-alkaline-phosphatase together was 90%. Of the commonly used tests these two were the most valuable. Recently two new tests had been described which showed considerable promise. These were, first, the estimation of the ratio of trihydroxy- to dihydroxy-bile acids in the serum, which was technically rather difficult; and secondly, the Jirgl flocculation test, which depended on alterations in the serum-mucoprotein fractions, and which had a D.E.I. of 96%. Of other tests of liver function he had found electrophoresis of the serum-proteins helpful in distinguishing the hypergammaglobulinæmia of hepatitis from hyper-α-globulinæmia of posthepatic jaundice. The prothrombin-time should always be estimated if there was a possibility of surgery; the response of the prothrombin test to loading with vitamin K was helpful only if the prothrombin-time was abnormal initially. Estimation of the serum-glutamic-oxaloacetic transaminase had a D.E.I. of 78% but was only helpful in the diagnosis of infective hepatitis in the first week at most of the disease. There were a number of anomalous hepatitic diseases, such as cholestatic jaundice, the Crigler-Najjar and Gilbert syndromes, and the Dubin-Johnson syndrome, in which the routinely used diagnostic laboratory tests were not very helpful. Professor Maclagan concluded by stressing the vital importance of history-taking and clinical examination in the diagnosis of hepatic disease.

## Public Health

### Live Poliomyelitis Vaccine in England

Bedfordshire County Council's health committee has agreed to participate in a limited trial of oral poliomyelitis vaccine of the type developed by Dr. A. B. Sabin, of Cincinnati, U.S.A.

The committee was informed that the Ministry of Health had approached about twenty local health authorities, including Bedfordshire, seeking their cooperation in a small clinical study of vaccination by an oral method, with the objects of ascertaining the optimum dosage and of gaining experience of such vaccination in this country. The studies are being carried out by the Medical Research Council in cooperation with the local health authorities. In each area about 25 children aged 6–9 months will, with the consent of the parents after full explanation, be vaccinated in this way.

Dr. W. C. V. Brothwood, county medical officer of health, emphasised that the trial would not in any way affect the current programme of immunisation with killed vaccine.

# In England Now

*A Running Commentary by Peripatetic Correspondents*

I WAS leaning on a gate set in the narrow lane up the side of a hill, and thinking about nothing in particular (' gaffering ' is the local word) except that the last week in May must surely be the most beautiful time of the year to take a holiday. There was no sound or sight of humanity until I saw an elderly woman approaching up the lane. She didn't notice me until she drew alongside, and this was hardly surprising because she was walking backwards. She gave a little start as she saw me, but lost none of her composure. " Oh, I didn't know anyone was here." I said I was sorry if I had frightened her. " Oh no, it wasn't that. But I only walk backwards when nobody's about. I don't like to do it in public, see." I hadn't an adequate answer, so she went on, " It's my blood-pressure, you know. If you have blood-pressure, you always ought to walk up hills backwards." I asked her where she had picked up this therapeutic titbit. " My husband's brother's doctor—he told him to do it. Wonderful difference it made to him. Get up any hill now, though it's a bit slow-like."

No, she didn't have any trouble with traffic. She could always hear it in this lane and had time to turn and face it if it was approaching from her rear—or vice-versa. We parted cordially. I urged her to take no notice of me, but to continue her walk in reverse, and she slowly vanished from sight up the hill, waving and nodding to the last, with only an occasional glance behind her to see that she was keeping a straight course.

* * *

We are accustomed in the country to dating events by the agricultural calendar, and it is not unusual, when estimating the expected date of delivery, to be told that the last period was " in the second week of lambing time ", or " just after we mowed off ", or even " the day after we put the cows in the fog ". We know where we are when we get sensible answers like these, but we were floored the other day when Helen came in to book her fifth. She is a farmer's wife and a farmer's daughter, but her answer to the usual question was " On the day that Barbara Moore reached Land's End ". Such is fame—or are we not as rural as we thought we were?

* * *

The doctor who stitched up my head told me he had a great admiration for the denomination in whose premises I had had my fall, but that he thought there was truth in all religions, and that the hope of the world lay not in the triumph of Christianity but in the World Congress of Faiths, and didn't I agree? Next morning, breakfast was hardly over before a genial ambulant patient came round to condole with me. Had a fall in a church, he understood. That meant that I read my Bible. Could I recite the Lord's Prayer? I found I was fit enough to recite it to him, word perfect. But that was not enough. Did I know the real meaning of " Thy kingdom come "? Did I realise that the Second Coming was imminent? What was more, did I realise that the Bible denies there is any such place as Hell? And he left me a pamphlet for my further instruction.

So if you want a quiet time in hospital, my advice is don't have your accident in a Church.

* * *

When so many small rooms display the notice, " Now, Wash Your Hands ", is it fair that the municipalities which minister to our comfort should demand 4*d.* for a wash and brush up? After all, they cannot collect very many 4*d.s*, and a free wash might save them a nasty epidemic. Why not 3*d.* for the brush up and nothing for the wash (and in these days of equality, let the ladies have it free too). I admit to being an obsessive hygienist, but the municipalities do administer the public-health laws.

* * *

The police-inspector was quite friendly at the beginning. " Just a spot test of all cars, sir." I turned the window down rather carefully as my thumb was bleeding from the last suture phial which I had opened, and I felt the cold night breeze replace the fairly strong smell of ether which pervaded my clothes and the interior of the car. The inspector looked at the blood-stained tissue wrapped around my thumb and sniffed, " What is your registration number? " I wondered a bit about that. Did he mean the number on the side of the engine or the number in the buff-coloured book or the number on the number-plate? I asked him. " The one on the front of this car." This very deliberately and eyeing me very steadily. Suddenly I was not sure. I could visualise two number-plates very clearly, but could not sort out which belonged to our previous car and which to our present one. In a mild panic, I found myself repeating the two combinations in a whisper and then I chose one. I told him. He checked. " Your number-plate is so dirty, I can't see for certain." But now he seemed less suspicious and I was considering a joke or two to round off the episode, when he barked at me " What are those handcuffs doing in your car? " " Handcuffs, I haven't got any handcuffs," a bit nervously, none the less. " Then whose are those? " with a triumphant flourish of his torch. Even before I turned almost, I could see the handcuffs wedged in the corner of the back seat. The alternatives were alarming. Had I been arrested on my way to the hospital and escaped in the earlier part of the evening? Was I so absorbed in the present unsuccessful series of experiments that I had forgotten this? Had I assisted an escaped criminal, perhaps a murderer? I reached back and carefully extracted the handcuffs from the corner of the seat. The metal was now soiled with blood from my thumb. I tried to wipe away the blood with my clean hand. The inspector, stern and uncompromising, looked at them carefully and mused " Small size, must be your youngster's." A few hours later at breakfast, my seven-year-old son casually warned me not to drive off with his handcuffs again, as he needed them for an emergency that very day at playtime.

* * *

During a long and varied career in laboratories in different parts of the world I have often come across thirsty scientists (and other people who were just plain thirsty) trying to open bottles of beer. They have been handicapped, sometimes to the point of despair, by the fact that many a laboratory lacks a bottle-opener. I think, therefore, I might do my fellows a service by publishing my most important discovery. The common laboratory boss (the thing that fixes a clamp to a stand, I mean, not the Prof.) is the finest bottle-opener made.

* * *

The final examination silly season is round again. The candidate and I gazed at the skeleton as we considered the possible complications of a depressed malar bone. He was a bright student and he noticed the infraorbital foramen and recognised its implications. Of course the intraorbital nerve could be damaged causing diminished sensation in the upper lip. I was encouraged to think he might realise the difficulties with shaving which ensue, so I persevered.

" What disability could this give rise to? " Pause for thought. " Difficulty with drinking." A further pause and then the light of knowledge dawned. " Of course, difficulty with courting, sir."

* * *

MALIGNANT ANSWER

The statistical ploy of the silly old boy
who was dreadfully rude to a Cohort in Bude
(see *The Lancet* last week)* has produced not a squeak
of alarm or dismay: but I feel I must say
we would go to the dogs if we gave up our logs;
as for factors like $p$ and $dx$ by $dt$,
they're essential for life if you're under the knife
or a radium bomb or a carcinotron.
So, Proband, seek proof and accept the Great Truth
that statistics can't lie and that when you do die
you will very soon see your memorial will be
(and you may find this hard) just a hole in a card.

* actually, June 11 (poetic licence).

# Letters to the Editor

## FLUORIDATION

SIR,—Having been overseas, I must apologise for entering so late into the lists battling on the subject of fluoridation. Reading through the letters in recent issues I feel that there is a very real fear that the smoke of emotional battle may cloud judgment on the evidence.

The work of Ainsworth, Weaver, Forrest, Cowan, and others in this country, Pederson and Poulson in Denmark, Sellman, Syrrist, and Gustafson in Sweden, Dean, Arnold, and others in the United States, in addition to studies from South Africa, Israel, and many other parts of the world, have all established beyond reasonable doubt that there is a clear lowering of the incidence of dental decay in areas with a high natural fluoride content of the water.

The evidence from Grand Rapids in the United States and Brentford in Canada, among other studies, have shown, again beyond reasonable doubt, that adjustment of the fluoride content of the water-supply to an optimum level causes approximately the same reduction in decay incidence as that found in the natural fluoride areas.

Anyone viewing these facts without bias must agree that fluoridation decreases the decay-rate in the teeth of children if the fluoride is absorbed during the formative period of the teeth.

Sutton [1] criticises control methods employed in some of the investigations. Some of his criticisms may possibly be valid, and to be scrupulously fair and allow for possible errors one could take, say, 5% from the positive side. This, however, does not make much difference when the success reported by many different workers varies between 30% and 60%, with a rough average of 50%. Even Sutton does not attempt to explain away the fact that all workers, in many different lands, have reported success. The striking fact is that not one single experiment throughout the world has shown that fluoridation does *not* in fact have an effect.

I think, therefore, that everyone, whether for or against fluoridation, must agree after assessing the evidence that it works. There are, really, therefore, only two points left for discussion: (1) is it safe? (2) is the adjustment of the fluoride level of the water-supply unethical and an interference with public liberty?

To take the first point—if we are to behave as rational beings and believe in the value of evidence we are forced to the conclusion from a very large and carefully sifted volume of statistics that there is no evidence of any untoward effects from any of the high natural fluoride areas or areas in which the fluoride content of the water-supply has been adjusted, provided that the fluoride level is within reasonable bounds. The upper limit of these bounds, incidentally, far exceeds the amount to which the fluoride content of the water is adjusted in experimental areas. It is perfectly true that nobody knows all the possibilities. I remember that years ago there was a vogue for blaming aluminium cooking utensils for an increase in gastric disorders. It was not accepted as there was no sound evidence. In brief, theories may wax and wane, but judgment at any particular moment must depend on the evidence available at that moment.

On the second point, we leave the realm of hard facts and enter the far more controversial one of what constitutes liberty of the subject. Any individual is at liberty to drink water from the nearest ditch if he so desires, but most of us prefer to drink water that has been treated and purified by a public authority. All natural water contains fluoride to a greater or lesser extent so that in fluoridation there is no question of adding a hitherto absent salt to the water; it is merely a matter of adjusting the concentration. It is perhaps not realised that the water we drink has already had a large number of chemicals added to it in the purification process, including in many instances both chlorinating agents and copper salts—both poisons in high concentration. There is no such thing, therefore, as "pure" water obtainable from the waterworks, and after conversation with water engineers I believe I am correct in stating that at least twelve chemical compounds are already added to the water. It does indeed seem strange that this affront to public liberty passes unchallenged when the adjustment of the level of a substance already present in the water to a level which is known to be beneficial, and which all the available evidence has been shown to be without danger, produces such an outcry.

I can assure those against fluoridation that members of the Fluoridation Study Group of the Society of Medical Officers of Health and other interested bodies in this country do not take their responsibilities lightly. They do try to assess the evidence fairly, while appreciating that everyone has the right to his or her own point of view. No-one has ever suggested that fluoridation is the final answer to end the problem of dental decay; but if the amount of dental decay among children in this country can be reduced by nearly a half, as all the evidence suggests, much pain, misery, and mutilation could be avoided. Perhaps those who talk about ethics could balance this fact against their own personal ethical objections.

School of Dental Surgery, University of Birmingham. ALEXANDER B. MACGREGOR.

SIR,—Having read Dr. Allen-Price's brilliant article (June 4) on the uneven distribution of cancer in West Devon I would have thought that Dr. Dalzell-Ward might have paused for a moment in his determined efforts to effect micropollution of the water-supply. Not that I am inferring that added fluoride causes cancer.

American opinions are presumably based on American research. Not everyone is satisfied that the statistical procedures in the American experiments are adequate, notably Philip Sutton in his book *Fluoridation: errors and omissions in experimental trials.*

Salisbury. HUGH V. CAPSTICK.

## SUPERDOSAGE CHEMOTHERAPY OF MALIGNANT DISEASE

SIR,—The leading articles on chemotherapy of malignant disease and bone-marrow preservation in your issue of Jan. 23 emphasise the advantages of superdosage of cytotoxic drugs in the control of disseminated cancer. Creech's method [1] of total-body perfusion requires preliminary aspiration of bone-marrow followed by reinfusion when the effects of the drug have passed off. It also requires aortic and caval catheterisation.

The Westminster Hospital method of Newton [2] requires an elaborate technique of marrow freezing and precautions to avoid osmotic damage of autologous marrow during cooling and rewarming.

Over the past few months, we have adopted a technique of superdosage chemotherapy which needs a minimum of apparatus and which allows us to store autologous bone-marrow safely in the patient's own tibial cavity for a period of 3–3½ hours.

Under anæsthesia, one or both legs have a tourniquet applied at the thigh and a tiny hole is drilled into the tibial cavity in its upper third. Marrow is aspirated into siliconed syringes from iliac crests and sternum, and injected immediately through the drill hole into the tibia. About 80–100 ml. can be transplanted, and at the conclusion of the procedure, which takes about 8–10 minutes, an otherwise lethal dose of drug is given intravenously. The tourniqueted limbs are kept cold with ice

1. Sutton, P. R. M. Fluoridation: errors and omissions in experimental trials. London, 1959.

1. Creech, O. J., Jr., Krementz, E. T., Ryan, R. F., Reemtsma, K., Winblad, J. N. *Ann. Surg.* 1959, **149**, 627.
2. Newton, K. A., Humble, J. G., Wilson, C. W., Pegg, D. E., Skinner, M. E. G. *Brit. med. J.* 1959, i, 531.

packs at a periosteal temperature of about 15°C for about three hours. In this way the marrow, both transplanted and indigenous to the tibia, is stored safely until the circulating drug is fixed into the tissues or eliminated, after which the tourniquets are released and anæsthesia is discontinued.

The time of tourniquet and regional hypothermia is determined by the drug used—three hours for mitomycin C, actinomycin D, and thiotepa, and 1½ hours for nitrogen mustard. Complications are negligible. Only transient paræsthesiæ of the foot for 24–48 hours have been noted in 4 of 11 cases with tourniquet times of 3½ hours. Although hæmatological depression and gastrointestinal ulceration have occurred, there has always been adequate marrow regeneration within 24 days, as shown by peripheral blood-counts and by preoperative and postoperative assessment of marrow activity using the $^{59}$Fe technique of Kramer and Wynne.[3]

We feel that the best place to store marrow is in a bone-marrow cavity.

New South Wales State Cancer Council,
Special Unit for Investigation
and Treatment,
Sydney Hospital, Randwick,
New South Wales.

A. FREEDMAN
G. DAVIDSON.

## ADDICTION TO DRUGS

SIR,—Mr. Harney (June 4) cannot reasonably complain about being misunderstood or misquoted if he repeats "misinformation" regarding the narcotic addiction problem. Surely, the best means of checking false or misleading items is by stating the known facts in positive terms.

He accuses me "of implying that there are no legal criminal sanctions against the abuse of narcotic drugs in the United Kingdom when there is no medical indication". I did not mention the criminal aspects of addiction at all (May 21) but stressed the fact that in the United States addiction is equated with crime whereas in the U.K. the emphasis is on treatment. This certainly does not mean that an addict may not be prosecuted for drug offences in this country. It stands to reason, however, that the person most likely to abuse narcotics would tend to be an addict. He would probably be bound over on a condition of treatment rather than penalised for an offence. Drug offences committed by non-addicts, although less common, are naturally regarded in a much more serious light.

Mr. Harney is reluctant to agree that addiction in the United States is much more a criminal matter than a medical one, but he clearly states in his letter that "coercive measures of treatment are necessary because the bulk of large city concentrations of American addicts is composed of hedonistic underworld characters". He asserts that the incidence of addiction has been reduced from 1 in 400 to 1 in 4000 in the past 45 years but he does not say whether this "good" result has been achieved by medical treatment or the activities of narcotic law-enforcement officers. Presumably it is the latter.

Mr. Harney says I stated that addiction is spread by peddlers who are attracted by the money to be made. Although I did not say that, I have no doubt that addiction is spread in this way to some extent. What I did say was that as drugs can only be obtained illicitly in the United States the price is prohibitive and addicts are compelled to resort to peddling in order to find the money to pay for their own supplies. I agree that the attraction is the drug and not the profit. But I reassert my view that there are powerful criminal elements who exploit this situation to their considerable advantage.

Mr. Harney estimates that there are still 60,000 addicts in the United States, which means that the incidence of addiction is twenty times greater than in the U.K. But his figures are rather curious: how can he reconcile a population of 175 million and an incidence rate of 1 in 4000 with a total of 60,000 addicts? My calculation would give the number of addicts as 43,750. If the figure of 60,000 is correct the incidence rate for a population of 175 million would be 1 in 2916.

From time to time we have had the pleasure of welcoming distinguished visitors from America who have studied the "British method" of dealing with addiction. Why is the easy lesson so difficult to learn—namely, that addiction is a matter for the medical profession?

If clinics were established where bona-fide addicts could receive injections pending their admission to hospital for a cure, trafficking in drugs would immediately become reduced and the tremendous evils associated with illicit drugging would be brought under control.

ELLIS STUNGO
Honorary Secretary,
London, W.1. Society for the Study of Addiction.

## AMNION IMPLANTATION

SIR,—I have had many questions from doctors who have read my article of March 12 on amnion implantation, asking how to prepare the amnion.

The amnion is collected fresh, straight after delivery, and stored in saline at 0° C for 4 days. It is then cleaned [1] by removing mucus and staining material with cotton-wool. After thorough cleaning the membrane is boiled in saline for 2½ minutes. It is then stretched over a ball of cotton wool and dried in a stream of warm air. It is then ready for use.

The amount used for each patient is roughly 12×12 in. and it is cut into 4 to 6 pieces and inserted into the same amount of pockets deep in the fat of the thigh of the affected leg. The wound is then closed with skin stitches which are removed on the 10th day.

Acton Hospital,
London, W.3. E. TROENSEGAARD-HANSEN.

## EFFECT OF VARIDASE ON PRESUMED CEREBRAL VASCULAR ACCIDENT

SIR,—The case recorded below may seem to have no place in a scientific journal like *The Lancet*, yet I feel it should be published.

Mrs. B., aged 70, collapsed on Dec. 1 in a shop, complaining of agonising headache. A colleague saw her and arranged for her removal home by ambulance. When I visited her two hours later she was deeply unconscious.

Next morning she could recognise me, speak to me, and had none of the paralysis which I had confidently expected. She complained only of very severe pain in the back of her head and in her neck.

Her condition remained unchanged until Dec. 5 when, because of the difficulty of visiting her and having her cared for, I admitted her to the local hospital. She was slightly pyrexial on admission and I prescribed chloramphenicol, which was given for five days while her evening temperature varied between 101·6° and 100·6°F. On Dec. 12 she was apyrexial. She became incontinent of urine on that day and on Dec. 13 she had a full-scale right hemiplegia with aphasia.

Her general condition deteriorated rapidly and on Dec. 16 a fatal outcome seemed inevitable. As a shot in the dark, I prescribed one 'Varidase' tablet (streptokinase and streptodornase) four times daily. Her deterioration halted. Two days later she began to show some small movements in foot and hand. Before Christmas Day she was able to express a wish, but not altogether clearly, to go home. On Dec. 26 she was able to walk with assistance and three days later she ceased to be incontinent. I reduced the varidase to two tablets daily. She was discharged from hospital on Jan. 4.

My last visit to her was on Jan. 10 when there was only slight residual weakness and no neurological signs which I could detect. She described herself as "able to do anything".

Because of what I left undone I cannot explain this case to myself with any confidence. My idea, half-baked perhaps, is that the hemiplegia was caused by cerebral thrombosis and that the varidase acted as well as its manufacturers claim in cases of thrombosis in other sites.

3. Kramer, H., Wynne, K. H. *Lancet*, 1958, ii, 1045.

1. *Brit. med. J.* 1956, ii, 262.

If I am to be shot down in flames for this view will someone please put forward another which will explain such a recovery? In more than thirty years of general practice I have seen nothing at all like it.

Launceston, Cornwall. DONALD M. O'CONNOR.

## ŒDEMA IN "COR PULMONALE"

SIR,—I was very interested to read the stimulating and thought-provoking article by Dr. Campbell and Dr. Short, on the cause of œdema in cor pulmonale, in your issue of May 28. While agreeing with all they have written and realising the complexity of this problem and the multiplicity of factors that must be responsible for the œdema, I was surprised to find no mention of the possibility of a low serum-albumin as a contributory factor in the causation of œdema.

I have often noted in such patients a low serum-albumin, which I have attributed to various factors such as (1) poor food intake due to dyspnœa, (2) hypervolæmia, and (3) depressed liver function; but in only one case (a man in respiratory failure following thoracotomy for a bullectomy) did I have the opportunity to give salt-free albumin intravenously, and I was very impressed by the profound diuresis produced. One case does not prove anything, but I should like to know whether others have had similar experience.

Seaham Hall Hospital, Seaham Harbour, Co. Durham. S. NARIMAN.

## HEPATITIS AFTER INOCULATIONS

SIR,—Ever since an outbreak of jaundice in a diabetic clinic was reported during the early years of the late war, and since seeing severe jaundice in soldiers three months after intravenous antisyphilitic treatment, I have been convinced of the necessity to use a separate sterile syringe for every inoculation. I felt that an explosive outbreak of serum jaundice, though not very likely, if it did occur would not be very creditable and all too explicable in the light of present knowledge.

I had, however, like all R.M.O.s given many thousands of jabs in the Army using a variety of unsatisfactory techniques without reported ill effect.

When the poliomyelitis inoculation campaign began I rejoiced that I was no longer dependent on a public authority on a war footing and persuaded my partners to buy 24 2 ml. syringes.

There is no difficulty nor is any large staff needed to keep these boiling in an ordinary portable spirit steriliser (ex-A.M.S. medical pannier type); I find that with my wife acting as receptionist and no other assistance I can inoculate 40 babies or 60 adults an hour using a separate boiled syringe and needle for each patient.

It is, I know, unlikely that a boiled syringe is as sterile as an autoclaved one but at the height of the polio campaign I was myself inoculating 140 young children in an afternoon week after week—what sort of large staff would have been required to provide 140 autoclaved syringes weekly to all the doctors in a county?

Furthermore, from all accounts, sterilisation techniques are subject to error even at the centre; I would be never too happy with a peripheral service and perhaps unreasonably prefer to see the water actually boiling. I comfort myself with the memory of at least one eminent and elderly surgeon removing a vast haggis of instruments in a wet cloth prior to cholecystectomy.

Let us be safe but let us be simple and above all let us avoid large staffs taking in each other's washing, at least at personal-doctor level.

Amble by Morpeth, Northumberland. R. P. ROBERTSON.

## SARCOIDOSIS AND LOCAL SARCOID-TISSUE REACTION

SIR,—I read with interest the paper on the diagnosis of polymyositis by Dr. Heathfield and Dr. Williams (May 28). They found histological sarcoid lesions in a few cases without the evidence of *other sarcoid lesions*, and had negative results of sarcoidosis in those cases (italics mine). It appears that there is still some confusion regarding the term "local sarcoid-tissue reaction".

Histological lesions simulating sarcoidosis has been described in many organs without the evidence of generalised disease.[1–3] Localised sarcoid-tissue reaction is not uncommon in muscles, and James [4] has shown that in these cases the Kveim test [5] is negative and there is no evidence of the generalised disorder.

Heathfield and Williams also state (p. 1160) that raised sedimentation-rate and hypergammaglobulinæmia is a feature of generalised sarcoidosis. James [4] showed that only a quarter of his 200 cases had abnormal globulin patterns in the blood. I have now analysed 30 patients with generalised sarcoidosis, and these findings are of interest. All 30 patients were admitted to hospital for investigation and were followed up in the outpatient department or at the associated chest clinics between 1956 and 1960. These patients were divided into the following groups:

*Group 1 (9 cases):* Bilateral hilar lymphadenopathy (B.H.A.) without any *clinical* evidence of sarcoidosis.
*Group 2 (5 cases):* Erythema nodosum with B.H.A.
*Group 3 (11 cases):* Diffuse pulmonary involvement with or without B.H.A. but with no *clinical* evidence of disease elsewhere.
*Group 4 (5 cases):* Clinical evidence of generalised disease.

The summary of the investigations is given below (figures in parentheses denote the number tested):

| *Investigations* | *Group 1 (9)* | *Group 2 (5)* | *Group 3 (11)* | *Group 4 (5)* |
|---|---|---|---|---|
| Abnormal white count (normal 5000–10,000) | 1 | 3 | 2 | 4 |
| Raised E.S.R. (Westergren) | 1 | 5 | 7 | 5 |
| Anæmia | .. | 2 | 1 | .. |
| Negative to 100 tuberculin units | 5 | 1 | 5 | 1 |
| Raised total proteins in blood (more than 8·2 g. per 100 ml.) | .. (7) | .. (5) | 1 (8) | 2 (5) |
| Raised globulins on electrophoresis | 1 (8) | 3 (5) | 6 (7) | 4 (4) |
| Raised serum-calcium (exceeding 11 mg. per 100 ml.) | 2 (8) | 1 (1) | 2 (8) | .. (4) |
| Raised alkaline-phosphatase (above 14 units) | 1 (7) | .. (..) | 1 (5) | 3 (4) |
| Raised urinary calcium [6,7] (above 300 mg. daily in men, above 250 mg. daily in women) | 2 (5) | .. (..) | 1 (3) | 1 (1) |

Most of these cases had biopsies from one or more recognised sites,[8] and the following are the results (figures in parentheses denote the number biopsied):

| *Biopsy* | *Positive results* Group 1 (9) | Group 2 (5) | Group 3 (11) | Group 4 (5) | Total |
|---|---|---|---|---|---|
| Kveim test and biopsy | 5 (5) | 4 (4) | 7 (7) | 3 (3) | 19 (19) |
| Liver biopsy | 5 (6) | 1 (1) | 6 (8) | 3 (3) | 15 (18) |
| Lymph-node biopsy | 3 (6) | .. (..) | 5 (5) | 3 (3) | 11 (14) |
| Other biopsies * | .. (..) | .. (..) | 0 (1) | 2 (4) | 2 (5) |

Possibly the interesting finding was the success with liver biopsy in these cases. Using a Menghini needle,[9,10] there was no mortality or morbidity from liver biopsies in these patients. A good correlation between the laboratory findings and clinical grouping was found.

This study was possible only through the help of many colleagues: Dr. E. Montsuchi did most of the liver biopsies; Dr. D. Geraint James did some of the Kveim tests. Recently a reliable antigen for Kveim tests was supplied to us by Dr. P. Bradstreet. The patients were admitted under Dr. J. W. Craig, Dr. P. Davies, Dr. A.

1. Symmers, W. St. C. *Amer. J. Path*, 1957, **27**, 493.
2. Gorton, G., Linell, F. *Acta radiol. Stockh.* 1957, **47**, 381.
3. Perry, D. C. *Med. J. Aust.* 1959, ii, 207.
4. James, D. G. *Quart. J. Med.* 1959, **28**, 109.
5. Kveim, A. *Nord. Med.* 1941, **9**, 169.
6. Pyrah, L. N. *Proc. R. Soc. Med.* 1958, **51**, 183.
7. Hodgkinson, A., Pyrah, L. N. *Brit. J. Surg.* 1958, **46**, 10.
8. James, D. G. *Brit. med. J.* 1956, ii, 900.
9. Menghini, G. *Rass. Fisiopath. clin. Terap.* 1957, **7**, 756.
10. Norris, T. S. M., Singh, M. M., Montuschi, E. *Lancet*, 1958, ii, 560.

Bloom, Dr. T. S. Norris, Dr. H. E. S. Pearson, Dr. M. Ashby, and Dr. A. L. Jacobs. I am very grateful to Dr. D. Geraint James for his helpful criticism.

Whittington Hospital,
London, N.19. SAMIR K. GUPTA.

## SOME UNCRITICISED ASSUMPTIONS IN PSYCHIATRIC THOUGHT

SIR,—There are some uncritical assumptions by Dr. McConaghy (March 19) in his provocative examination of current psychiatric thinking.

The dynamic therapist has by no means rejected symptom relief as an index of therapeutic success. The vast majority of patients in psychiatric hospitals where dynamic psychotherapy is practised are discharged when their symptoms are relieved or at least reduced to a point where they no longer impair job, school, or family performance. Dr. McConaghy mistakenly identifies dynamic psychotherapy with psychoanalysis.

Where the doctor, by dint of his presence in a human relationship, somehow influences the attitudes, behaviour, mood, and/or feelings of the patient, he is practising dynamic psychotherapy. This treatment is based partly on the assumption that, as people have been influenced in their previous development and experience by parents, teachers, &c., so too they may be influenced in a hopefully beneficial and corrective way by a doctor who is familiar with human problems and the more subtle features of interpersonal relationships.

Again few people would believe that an interpretation to a patient of the significance of his behaviour would cause any lasting or meaningful change in the patient's attitude or behaviour. Interpretations are beneficial in helping patients to understand the nature of fixed habits, and perhaps to see alternative ways of dealing with life issues. It is from this point that the patient may gain a greater awareness of the range of personal choices and of the opportunities which may help him to grow. But the change must derive from the patient to be of any significance and cannot really be suggested by the psychiatrist.

Johns Hopkins Hospital,
Baltimore, Maryland. ARI KIEV.

## KEROSENE (PARAFFIN) POISONING

SIR,—Dr. George (April 9) states that kerosene is a mixture of various liquids and that the toxicology of some of these liquids is not known in full, while others may be anæsthetic and narcotic. Therefore he considers that we should continue to encourage rapid evacuation of the ingested kerosene by gastric lavage, ignoring the danger of aspiration pneumonitis, and turning a blind eye to the considerable body of evidence which suggests that absorption of small amounts of kerosene after ingestion is a less serious problem.

We should like to reply to some of the specific points raised by Dr. George:

(1) The commonly ingested grades of kerosene (paraffin oil) are premium (household) kerosene and regular kerosene. Naphthenic acids in these grades are not likely to be found in concentrations above 0·1% and these carboxylic acids have a low order of toxicity.

(2) A number of different kerosenes were studied by Deichmann [1] and all of them were found to have a low order of oral toxicity—even lower than the kerosene cited in the table in our previous letter of Jan. 30. Thus, the changes in compositions which may occur in the various kerosenes have little effect on the oral toxicity.

(3) There is considerable knowledge on the toxicity of the alkyl derivatives of benzene, contrary to the statement made by Dr. George.[2–4]

(4) There is no treatment for chemical pneumonitis. Antibiotics are only of use to prevent bacterial pneumonia which may be a complication superimposed on the initial chemical pneumonitis.

(5) Delay in absorption keeps the blood levels low, thus permitting storage and metabolism (detoxification) of the hydrocarbons. These hydrocarbons are readily metabolised. Brief high blood-levels may be more dangerous.

(6) Richardson [5] studied kerosene absorption and its effects when administered to dogs and rabbits in a variety of ways—intragastrically, intravenously, by intestinal fistula, and intratracheally. From this data he calculated that in a 50 lb. child (aged about 7) the lethal dose would be in excess of one pint provided aspiration did not occur. On the other hand, if slightly more than a teaspoonful were aspirated, severe pneumonitis, with an almost certainly fatal outcome, would result.

(7) The risk of aspiration from vomiting is particularly high because of the very low surface tension which makes a small volume spread rapidly over a large area.

(8) In animals the ratio of $L.D._{50}$ intratracheal to oral dosage is 1 to 140.

We would reaffirm our view that in the treatment of kerosene poisoning it is much safer to leave the kerosene in the alimentary tract than to attempt its removal by gastric lavage, on account of the danger of aspiration leading to pneumonitis.

Esso Petroleum Co., London, S.W.1. E. H. CAPEL
Chief Medical Officer.

Esso Petroleum Co., Fawley,
near Southampton, Hants. A. WARD GARDNER
Senior Medical Officer.

## CORPORAL PUNISHMENT

SIR,—Dr. Webster (April 2) accuses Dr. Waycott, by implication, of "logical fallacies" and "sentimentality". Is this really so? Is Dr. Waycott's argument fallacious? And can he justifiably be called sentimental? In the same way can one not accuse Dr. Webster of harshness and rigidity? Perhaps not, without being subjective.

Firstly, Dr. Webster makes what I consider to be a logical fallacy *par excellence* in comparing delinquent boys with Pavlov's dogs. Is a delinquent boy, in his response to corporal punishment, comparable to a non-human vertebrate in its response to noxious stimuli under controlled experimental conditions? The boy has his whole childhood experiences, some pleasant, others unpleasant, some ego-syntonic, others ego-dystonic, some conscious and others unconscious—all conditioning, true enough, as in Pavlov's experiments—which will determine to a great extent how he will react in a given situation. These early experiences (within the first six months of life especially, and certainly within the first five or six years), although in the strictest sense of the word "conditioning", and therefore analogous to Pavlov's dog experiments, can in no logical and realistic way be compared to the conditioning stimuli in those experiments. A dog does not have personality in the sense that human beings do. Dogs and delinquent boys simply cannot be realistically equated in the way Dr. Webster professes they can.

He compares giving anæsthetics to patients for dental extractions or toenail avulsions with administering corporal punishment to a delinquent boy. Did he mean that the technique of giving this punishment was unpleasant to the donor, or to the recipient? In either case his argument is invalid: the doctor injecting a local anæsthetic *knows* that the end-result of his efforts is going to be success, and can do so with complete objectivity, whereas the person who does the birching of the boy does *not* know that his "treatment" will be efficacious; indeed, he may be utterly indifferent. But equally well, he may be satisfying unconscious sadistic needs—this has been borne out again and again in English and American penal history. What other effect can one expect but bitterness and

1. Deichmann, W. B., Kitzmiller, K. V., Witherup, B. S., Johansmann, R. *Ann. intern. Med.* 1944, **21**, 803.
2. Gerarde, H. W. *A.M.A. Arch. industr. Hlth*, 1956, **13**, 468.
3. Gerarde, H. W. *ibid.* 1959, **19**, 403.
4. Gerarde, H. W. Toxicology and Biochemistry of the Aromatic Hydrocarbons. Amsterdam (in the press).
5. Richardson, J. A., Pratt-Thomas, H. R. *Amer. J. med. Sci.* 1951, **221**, 531.

hatred from delinquent boys when corporal punishment is indiscriminately applied? This is comparable to treating hæmorrhage from, say, the inferior mesenteric artery during a laparotomy by closing the abdomen in layers—to damming a river as it flows into the sea instead of at its source, when its banks have overflowed. One must *attack the root cause* of the delinquency, and the only way of doing this when it becomes manifest is by a psychiatric approach—psychotherapy given by *competent* therapists. It is of no use "to beat the hell out of" (a colloquialism here) the delinquents, as the Cadogan report so rightly concluded, as this builds up bitter resentment when such "treatment" reinforces old patterns of rejection. The delinquents must undergo a "corrective emotional experience"—as must all neurotics and patients with character disorders (Franz Alexander).

When he writes "some of us reactionaries are not very much interested in his point as to the value or otherwise of corporal punishment in constructive treatment of offenders" Dr. Webster is pessimistically admitting defeat before he even starts to attempt to repair the personality of a human being heading for psychological ruin—in fact, he is "selfishly" (his own word) assisting that fellow-being in reaching such ruin.

Hospital of the University of Pennsylvania, Philadelphia. IAN MACKAY.

## SNAKEBITE

SIR,—Mrs. Buckley (June 18) wants a more specific word than "poisoning", to mean snakebite. I suggest "snakebite" or, if it is fatal, "fatal snakebite". (In theory a non-poisonous snake might bite a man, but not more often, perhaps, than a man bites a dog.)

London, S.W.20. JOHN PENMAN.

## ADRENALECTOMY AND HYPOPHYSECTOMY

SIR,—I have read with interest the article by Mr. Atkins, Mr. Falconer, and their colleagues (May 28), together with the ensuing correspondence.

It seems to me that their conclusions have to a great extent clarified the position of these various operations. On theoretical grounds one might have predicted the main conclusion since the pituitary is in a sense the "traffic policeman" of the glands of internal secretion.

My purpose now, however, is to draw attention to the fact that the pituitary has been shown to be accessible via the nasal sinuses since Nager, of Zürich, gave his Semon lecture in London in 1939. Possible routes to the pituitary are via the septum, through an external incision via the ethmoid, or through the maxillary sinus and ethmoid. These routes have been used in Scandinavia and in this country, singly or in combination.

A further method of approach, using the nasal bones as an osteoplastic flap, will be published elsewhere in the near future. This approach, while keeping in the midline, shortens the access and enables free use of the operating microscope.

With any of these methods of access the operation would appear to be less disturbing than either adrenalectomy or the intracranial removal of the pituitary. Furthermore the time in hospital is usually predictable and should be no longer than that needed for any patient undergoing an external ethmoidectomy—i.e., 7–10 days.

If, as seems likely, the rhinological approach to the pituitary proves to give as good results as the neurological, the practical problem noted by Atkins and his colleagues—that too few neurosurgical beds are available for this work—will to some extent be solved.

Radcliffe Infirmary, Oxford. RONALD MACBETH.

## TOO MANY CALORIES

SIR,—In your excellent leading article on obesity (June 11) you refer to the contrast between the findings by Dr. Duncan and his colleagues in Edinburgh [1] that methyl cellulose was ineffective in the treatment of obesity, and my finding [2] that it was effective. I am writing to draw attention to some of the differences in these two sets of experiments, one or more of which may account for the different results.

Firstly, there were clearly differences between the type of patient. The Edinburgh patients are rightly called "refractory", and the controls without drugs did not lose weight significantly during the experiment; my control patients lost six pounds in six weeks. Secondly, the Edinburgh workers gave 4·5 g. methyl cellulose daily, compared with the 9 g. which I gave. Thirdly, the preparation used in Edinburgh was in the form of tablets, which do not swell to the same extent as the powdered methyl cellulose used by me.

It is then reasonable to conclude that at least some obese patients will find it useful to take methyl cellulose, provided they take sufficient and it is in the powder form.

Queen Elizabeth College, London, W.8. JOHN YUDKIN.

## THE PERSONAL DOCTOR

SIR,—Dr. Fox, in *The Lancet* of April 2, writes that attracting the younger practitioner to the country is a difficult matter in the United States. This is not, in my experience, completely true.

While it may well be that many rural areas are "underdoctored", a large fraction of my own generation (class of 1942) have already established themselves not only in the suburbs but also in "exurbia". Older men and younger men, too, are moving out of the cities. As a matter of fact, one of my teachers in medical school moved his practice from Brooklyn to the remote suburbs on Long Island long after I had left the City of New York permanently. As this man was a chief of service in one of Brooklyn's outstanding voluntary hospitals, and a specialist certified by an American specialty board, one can scarcely regard his removal as reflecting any sort of failure or maladjustment on his part. Indeed, I hear that his old hospital in Brooklyn is trying to lure him back.

As for myself, I could not afford to bring up my five children, as I do now, in New York, even if I could maintain my present income in the city. The assumption that I could maintain my present income in New York, or in any other metropolis, is utterly unfounded (I am a pathologist). Further, I could not enjoy the freedom of directing my own laboratory without lay interference, as I do here. A metropolitan hospital would never give up control of the laboratory's purse strings. This, by the way, is very much the case at the Hunterdon Medical Center, where the pathologist's share of laboratory income goes into the group's treasury, rather than into the hospital's pocket. The result is that both the Hunterdon pathologist and I need not battle any sort of bureaucracy for needed funds. (I happen to know Hunterdon because we are the hospitals closest to each other in New Jersey, because the pathologist there and I have had training in the same institution, and because the pathologist and I are old friends who "cover" for each other often.)

There is a great deal of interesting information in Dr. Fox's article, much of it new to me. I think, nevertheless, that it fails to point out an important aspect of the lack of physicians in rural areas. That is the failure of the small community to meet the needs of modern practice. Once it does so, physicians will leave the "rat-race" of the big city; these physicians will be well-qualified specialists as well as generalists. The example of Hunterdon has been cited. Warren Hospital, its closest neighbour, in Phillipsburg, New Jersey, has no

1. Duncan, L. J. P., Rose, K., Meiklejohn, A. P. *Lancet*, June 11, 1960, p. 1262.
2. Yudkin, J. *ibid.* 1959, ii, 1135.

medical-school affiliation or support from funds or foundations (save for the building fund, raised by public subscription, *locally*). It is a 200-bed hospital. There are fully qualified general surgeons, ophthalmic surgeons, obstetricians and gynæcologists, orthopædic surgeons, pædiatricians, internists, otolaryngologists, and urologists, as well as generalists on the active staff. There are available neurosurgeons, thoracic surgeons, dermatologists, and neuropsychiatrists, who are nearby and fully qualified, as consultants (with appointments to the consulting staff of the hospital).

This must, to a great extent, be attributed to the hospital board's foresight in making full-time appointments in three departments: anæsthesia, pathology, and radiology. In order to make these appointments a reality, they must offer the appointees enough professional independence (as well as mere financial gain) to attract them from the security of the larger institutions. All three of these specialists do a great deal more work in hospitals such as Hunterdon or Warren than would be expected of them in New York, Boston, Philadelphia, or Chicago, where small armies of specialists man these departments, and where the specialties are subdivided (e.g., diagnostic and therapeutic radiology, or morbid anatomy and clinical pathology).

Of course, all is not perfect, either at Warren or at Hunterdon, but the good so far outbalances the bad that neither Hunterdon's pathologist nor I is seeking another appointment. The opposite is, to my personal knowledge, the case in several New York hospitals.

Phillipsburg,
New Jersey. PAUL DE R. KOLISCH.

## CLOSING MECHANISM OF THE FEMALE URETHRA

SIR,—In his letter of April 2 (p. 770) Dr. Vantrappen explains the statement of Mr. Goldberg (March 19) that when the lower œsophagus is above the diaphragm its sphincteric function fails. With inspiration the intrathoracic pressure decreases and the intra-abdominal pressure increases, thus resulting in a fall of pressure from the stomach to the part of the œsophagus above the diaphragm. If, however, the lowest part of the œsophagus is below the diaphragm an inspiration would increase its pressure to the same extent as it would increase the pressure of the stomach, and there would be no reason for reflux of gastric juice. This explanation has caught my interest, since I have found that the same closing mechanism controls another outlet from the abdominal cavity—the female urethra.

The fact that the urethra can be penetrated from the outside into the bladder with a pressure no higher than 100 cm. of water, whereas a cough may increase the pressure within the bladder to as much as 250 cm. of water without normally causing leakage, points to the possibility of the upper urethra being functionally within the abdominal cavity. If it were, a cough would increase the pressure within the upper urethra to the same extent as within the bladder, and there would be no stress on the sphincter function of the urethra. To testify this hypothesis 100 women (50 without urinary complaints, 25 with stress incontinence, and 25 who had had their first delivery six days earlier) were examined with simultaneous recording of intravesical and intraurethral pressure. A double catheter, 25 cm. long and with an outer diameter of 1·9 mm., was used. From the apex of the catheter the intravesical pressure was lead to an electromanometer, and from a balloon of thin rubber 6 cm. from the apex the intraurethral pressure was lead to another electromanometer (fig. 1). The pressures were recorded with a two-channel Elema Mingograph.

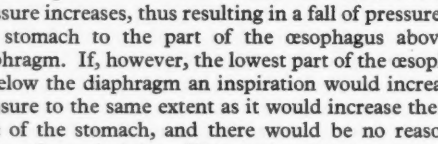



**Fig. 1.—Measurement of intravesical and intraurethral pressures.**

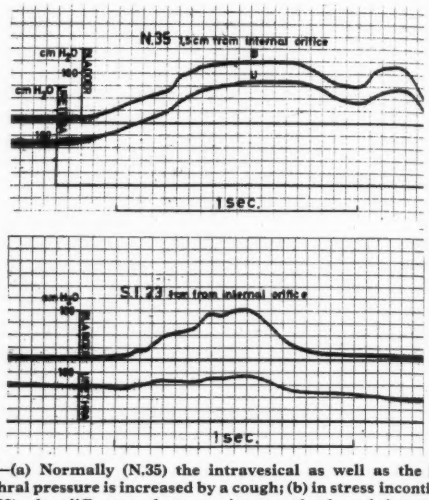



**Fig. 2.—(a) Normally (N.35) the intravesical as well as the intraurethral pressure is increased by a cough; (b) in stress incontinence (S.I.23) the difference between intraurethral and intravesical pressure becomes zero.**

During the examination the patient was lying in the lithotomy position. The bladder was filled with 250 ml. of saline solution, the catheter was introduced and then stepwise withdrawn, 0·5 cm. at a time. In every position of the catheter the intravesical and the intraurethral pressures were simultaneously recorded, both when the patient was asked to relax and when she was asked to cough vigorously. With this method it was found that when the normal woman relaxes, the pressure in the two upper thirds of the urethra was from 50 to 150 cm. of water. When a cough increased the pressure of the bladder, the pressure in the upper urethra was simultaneously increased and therefore the intraurethral pressure remained considerably higher than the intravesical pressure. In stress incontinence, however, a cough did not increase the intraurethral pressure to the same extent as the intravesical pressure, and, in the moment when incontinence was manifested, the difference between these two pressures was zero (fig. 2).

Sabbatsberg Hospital,
Stockholm,
Sweden. GÖRAN ENHÖRNING.

## EXPIRED-AIR RESUSCITATION

SIR,—I have been following this correspondence with interest, and should like to make a few remarks.

Many lives have been saved in Sweden, some of them by children, since the technique of expired-air resuscitation was demonstrated on television two years ago. The "patient" was not a dummy but a curarised anæsthetist. This film has been rebroadcast, and must by now have been seen by a very large number of people. Recently a man kept his wife alive during acute respiratory obstruction (due to retrosternal thyroid adenoma) until she could be got to hospital; he had no special training, and merely did what he had seen on television. This case also illustrates a unique feature of the technique: by no other method of artificial respiration can the inspiratory pressure be raised and an obstruction forced, and no other method would therefore have been of any use in this case.

The name "expired-air resuscitation" is, of course, the most appropriate one; but I believe that the lay rescuer is helped by the simple term "mouth-to-mouth breathing", which is used in this country, because it tells him exactly what he has to do in the heat of the moment.

The objections that have been raised on æsthetic grounds have proved to be theoretical: there is no hesitation when the need arises.

The method is this year being adopted officially by all authorities throughout Sweden—a country where drowning is common.

Uppsala, Sweden. MARCIA SKOGH.

## PAY INCREASE TO MEDICAL SUPERINTENDENTS

SIR,—The proposed increase of £250 per annum to mental hospital superintendents appears singularly inappropriate at a time when the new Mental Health Act is hoped to stimulate experimentation in medical administration. It will be recalled that this increase in remuneration was recommended to the Royal Commission by the Medical Superintendents' Association but was not supported by the British Medical Association, the Royal Medico-Psychological Association, or the Central Consultants and Specialists Committee.

In the hospital of the future we can expect psychiatric units to be linked with general medical and surgical units, and the medical superintendent, if any, may as likely be a surgeon or a physician as a psychiatrist. The conditions, therefore, under which this pay award was recommended for medical superintendents of mental hospitals now no longer seem to exist and its implementation, therefore, becomes irrelevant.

London. A. J. OLDHAM.

## COMPARISON OF CEREBRAL FAT AND AIR EMBOLISM

SIR,—The case of cerebral fat-embolism reported by Harnett et al.[1] has many features in common with air-embolism, and a comparison between the two conditions may be of interest, especially in relation to treatment and prognosis. Moreover, it seems desirable to record, for its own sake as well as for comparison, the following case which occurred in 1952 as a complication of extrapleural pneumothorax.

A girl, aged 18, had cerebral air-embolism while sitting up after receiving a 150 ml. refill of an extrapleural pneumothorax. Half a minute after completion of the refill, she suddenly fell back. She was found to be unconscious and was, having right-sided convulsions. Her face was extremely pale, the pulse was impalpable at the wrist, and respirations were shallow and jerky.

In this patient, and in the girl with fat-embolism described by Harnett et al., embolism resulted in deep coma, though with fat-embolism consciousness did not return for two to three weeks, compared with thirty-six hours in the air-embolism case.

The clinical features in both cases suggested widespread focal lesions in the brain. There was deviation of the head and eyes to the left, and gross spastic paralysis of arms and legs, less complete on the right than on the left. This distribution is to be expected in air-embolism in a sitting patient, because the bubbles would tend to go up the right innominate and common carotid arteries. There would be a similar though weaker effect with buoyant emboli where a patient was supine. Experiments with dogs have shown that in arterial air-embolism, the site of ischæmia is determined by the principle of air buoyancy.[2]

Voluntary muscular activity began to improve in the fat-embolism case during the fourth week, and in the air-embolism case on the fourteenth day, at which time also sensation of pain was appreciated again in the upper limbs.

A year after the occurrences, the main features may be described under two headings.

*Central nervous system.*—The fat-embolism patient still had slight spasticity of the lower limbs and impaired cutaneous sensation along the outer border of the right foot. In the air-embolism patient, the right upper and lower limbs were apparently normal. The muscular power of the left upper and lower limbs was estimated as being 75% normal in the main, but with residual foot-drop, wasting of the interossei, and wasting of the thenar and hypothenar eminences. Knee and ankle jerks were still spastic and muscle-joint sense appreciation was variable.

*Mentality.*—The fat-embolism patient had previously been rated as average and was now regarded as being possibly "dull normal". The mother agreed that personality and behaviour recovery was remarkably complete, though some of the previous traits were now more pronounced. The parents of the air-embolism patient considered that there was no deterioration in her intelligence. The mother reported spontaneously that the experience must have done the patient some good: before she had been difficult and moody, but was now much happier and contented.

Further progress in the fat-embolism case was not recorded. Three years after the embolic episode the air-embolism patient continued to improve. The muscular power of the left upper and lower limbs was almost normal, though there was still wasting of the interossei and the eminences. She could now walk without a limp, though slight foot-drop was apparent when she ran. Knee and ankle jerks were normal and muscle-joint sense had definitely improved.

*Electroencephalography.*—Fat-embolism: suggested "multiple diffuse emboli scattered through the brain substance, probably most concentrated in the left temporal area". Air-embolism: E.E.G. was not performed until seven weeks after the embolic episode when the report was "mild generalised dysrhythmia with frequent outbursts of theta and some random delta activity. There is no evidence of focal brain damage". Serial E.E.G. examinations of a similar case [3] showed obliteration of normal cortical activity with gradual return towards normal.

The air-embolism patient was examined by a neurosurgeon ten days after the embolism. His opinion was that, in the normal course of events, very little improvement could be looked for from such extensive lesions in the central nervous system. Roessle [4] reported that, where the patient survived, no abnormality could be detected at subsequent necropsy, even when scarring would have been expected.

The girl who had the fat-embolism was last described as being more-or-less her previous self. When last seen, the air-embolism patient was also leading a normal life, had married and become pregnant.

The following may also be of value in treatment.

*Posture.*—The head should be lowered to reduce the likelihood of bubbles travelling up the carotid arteries. Banyai [5] recommended that the patient must "practically be stood on his head". The patient should probably be positioned midway between the prone and left lateral position in an attempt to bypass the openings of the carotid arteries. This position will also relieve any obstruction due to air-lock in the outflow tract of the right ventricle if the air has entered via the systemic venous system.[2]

*Analeptic.*—A cardiorespiratory stimulant is usually needed to combat the effect on the vital centres. In view of the acuteness of the condition the intravenous or intracardiac route is recommended.

*Oxygen.*—Oxygen should be given as soon as possible and continued. Kelly et al.[3] reported that the continuous breathing of oxygen caused substantial improvement in paralysis, even though its use had been delayed for three days.

*Cerebral vascular dilators.*—In view of the vascular spasm associated with air-embolism, cerebral vascular dilators may be of value; but the individual emboli result in infarct-like and necrobiotic areas of cerebral matter and focal hæmorrhages, so that a vascular dilator would aggravate this tendency and outweigh any initial benefit. The air-embolism patient was treated with posture, intracardiac stimulant, and oxygen, but no vascular dilator.

1. Harnett, R. W. F., Paterson, J. R. S., Lowe, K. G., Stewart, I. M., Uytman, J. D. *Lancet*, 1959, ii, 762.
2. Durant, T. M., Oppenheimer, M. J., Webster, M. R., Long, J. *Amer. Heart J.* 1949, **38**, 481.
3. Kelly, H. G., Gibson, W. C., Meakins, J. F. *Canad. med. Ass. J.* 1947, **5**, 388.
4. Roessle, R. *Virchows Arch.* 1948, **315**, 461.
5. Banyai, A. L. Pneumoperitoneum Treatment. London, 1946.

In cerebral fat and air embolism initial and prolonged follow-up treatment becomes all the more important when one realises how remarkable the clinical recovery may be even after severe coma and paralysis.

I am grateful to Dr. A. S. Hutcheson, consultant chest physician, Argyll Area, for criticism of this report.

County Sanatorium,
Oban, Argyll. PETER MACPHERSON.

## TRIAL OF A NON-SPECIFIC ANTI-CATARRH VACCINE

SIR,—Treatment of chronic respiratory infection, with persisting cough and dyspnœa, is disappointing, especially in the established stage of the disease. Acute exacerbations are often preceded by an upper respiratory infection which spreads to the chest. Each attack leaves the patient worse, so it is desirable to prevent such upper respiratory infection. The use of broad-spectrum antibiotics has become popular,[1–5] but is expensive.

Ritchie [6] reported favourably on the use of an autogenous vaccine in the prophylaxis of the common cold, and he believes that most effects are caused by the relatively enhanced virulence of the patients' normal nasopharyngeal flora after depression of resistance by the virus. Unfortunately the giving of autogenous vaccines on a large scale is not practicable. The effect has been tried of a specific anticatarrhal vaccine on a group of patients with recurring respiratory infection.

Each ml. of vaccine contained:

| | | | |
|---|---|---|---|
| *Neisseria catarrhalis* | 50 | million | organisms |
| *Bacterium pneumoniæ* | 50 | „ | „ |
| *Hæmophilus influenzæ* | 250 | „ | „ |
| Streptococci | 25 | „ | „ |
| Pneumococci | 250 | „ | „ |

Patients were given 0·25, 0·5, and 1 ml. subcutaneously at intervals of seven days, starting in the autumn of 1958, and continued with 1 ml. at monthly intervals until March, 1959. Not all had the full course.

The injections were given as part of the work of an asthma injection clinic. Patients were allocated to treatment and control groups (who received sterile water) by the clerk arranging appointments for injection, so the physician ordering the vaccine did not know if the patient would receive it. It had been proposed that 1 patient in 4 should be a control, but it was found that of patients who did not attend for the first injection more had been allocated to the control group. In all, 79 received the vaccine and 15 sterile water (see table I).

TABLE I—AGE AND SEX DISTRIBUTION OF THOSE RECEIVING THE VACCINE AND STERILE WATER

| Age | Controls | | Recurrent respiratory infections | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| 0–14 | 4 | 3 | 12 | 11 |
| 15–34 | 0 | 2 | 6 | 6 |
| 35–54 | 1 | 1 | 12 | 16 |
| 55+ | 1 | 3 | 3 | 13 |
| — | 6 | 9 | 33 | 46 |

The results were assessed in May and June after the course was complete, and we studied the record cards of the injections with the noted replies to questions on progress at each visit. Those reporting no acute exacerbation or only one or two colds through the winter, with no bronchitis, were classed as a good result. Those reporting no benefit were classed with those who reported slight improvement on previous years. The results are given in table II, with males and females combined since no sex difference was found. There is no significant difference between the controls and those receiving the vaccine.

1. Helm, W. H., May, J. R., Livingstone, J. L. *Lancet*, 1954, ii, 630.
2. Helm, W. H., May, J. R., Livingstone, J. L. *ibid.* 1956, i, 775.
3. May, J. R., Oswald, N. C. *ibid.* 1956, ii, 814.
4. Moyes, E. N., Kershaw, R. A. *ibid.* 1957, ii, 1187.
5. Edwards, G., Fear, E. C. *Brit. med. J.* 1958, ii, 1010.
6. Ritchie, J. M. *Proc. R. Soc. Med.* 1958, **51**, 273.

TABLE II—RESPONSE TO TREATMENT

| — | Controls | Recurrent respiratory infections |
|---|---|---|
| Good result | 3 (20%) | 20 (25·3%) |
| Moderate improvement | 4 } 11 (73·3%) | 30 } 56 (70·9%) |
| Stationary | 7 } | 26 } |
| Worse | 1 (6·6%) | 3 (3·8%) |
| — | 15 | 79 |

Patients with chronic bronchitis and parents of catarrhal children appreciate fresh interest and attempts to ease their troubles. They are, therefore, probably reporting greater improvement than has actually occurred. Psychological factors were also probably responsible for the reactions reported. 2 patients who received the vaccine reported " colds " for 24–48 hours after each injection, while 3 of the controls reported tightness of the chest after each injection of sterile water.

The difference in results in non-specific and autogenous vaccines may be accounted for in the very heterogeneous nasopharyngeal organisms of the general population. Unfortunately laboratories are not willing to make autogenous vaccines. The organisation of the injections was not difficult and attendance was good, even in bad weather. Patients with recurrent chest infections will go to considerable trouble in pursuit of something they hope will help.

Trial of this non-specific anticatarrhal vaccine as a prophylactic against recurrent chest infection has shown it to be useless.

Harrow Chest Clinic,
Middlesex. J. B. CLARK
R. GRENVILLE-MATHERS.

## RELIEF OF PAIN IN RESPIRATORY FAILURE

SIR,—We have been interested for some time in the problem of management of pain in patients with respiratory failure. It is generally agreed that the most effective drug —morphine—is contraindicated because of its depressant effect on the respiratory centres. When pethidine was introduced in 1939 it appeared to be the answer to the problem, but it has since been shown that when given in a comparable analgesic dose the drepessant effect is similar.[1 2] Recent experience in anæsthetics and obstetrics has shown that mixtures of pethidine and a small dose of a narcotic antagonist (levallorphan) cause less respiratory depression than pethidine alone.[3–7] Hossli and Bergmann,[8] using such a mixture to treat postoperative pain, showed that the analgesic effect is in no way impaired.

The use of a proprietary mixture 'Pethilorfan' (Roche) containing pethidine and levallorphan in the proportion of 80 to 1 for the relief of pain in a number of respiratory cripples impressed us favourably, both with regard to its analgesic action and apparent freedom from respiratory depression. We decided to determine objectively the effect of this mixture on respiration by repeating respiratory function tests one hour after injection (containing pethidine hydrochloride 100 mg. and levallorphan tartrate 1·25 mg.) in a consecutive series of patients admitted for the investigation of respiratory failure who were undergoing routine physiological assessment. The mean values and standard deviations in this small series of 12 patients are recorded in the accompanying table.

1. Prescott, F., Ransom, S. C., Thorp, R. H., Wilson, A. *Lancet*, 1949, i, 340.
2. Loeschcke, H. H., Sweet, A., Kough, R. H., Lumbertsen, C. J. J. *Pharmacol.* 1953, **180**, 376.
3. Lloyd, T. S. *Va med. Mon.* 1956, **83**, 551.
4. Roberts, H., Kane, K. M., Percival, N., Snow, P., Please, N. W. *Lancet*, 1957, i, 128.
5. Hunter, A. R. *Brit. J Anæsth.* 1958, **30**, 233.
6. Foldes, F. F., McNall, P. G., Koukal, L. R., Tanaka, R. *Anæsth.* 1959, **14**, 255.
7. Posner, A. C. *Brit. med. J.* 1960, i, 124.
8. Hossli, G., Bergmann, G. *Schweiz. med. Wschr.* 1959, **89**, 863.

EFFECT OF PETHIDINE-LEVALLORPHAN MIXTURE ON RESPIRATORY FUNCTION

| — | Respiratory-rate per min. | Tidal air (ml.) | Minute volume (litres) | P.E.F.R. | Arterial blood-level | |
|---|---|---|---|---|---|---|
| | | | | | $O_2$ (vols.%) | $Co_2$ (vols.%) |
| Mean value before injection | 17·5 (±5·23) | 783·3 (±436·6) | 11·68 (±2·60) | 159·58 (±21·27) | 15·15 (±3·37) | 45·31 (±5·41) |
| Mean value after injection | 20·5 (±8·06) | 755·8 (±450·6) | 12·48 (±2·11) | 170·83 (±22·75) | 15·06 (±3·26) | 45·70 (±6·08) |
| Difference between mean values .. | +3·0 | −27·5 | +0·8 | +11·25 | −0·09 | +0·39 |

Figures in parentheses = standard deviation.

The figures suggest that there was improvement rather than depression of respiration following the use of pethilorfan, but analysis using the "t" test shows that the changes are not statistically significant. Nevertheless it is clear that the respiratory depression known to follow the use of pethidine did not occur.

A mixture of pethidine and levallorphan in the proportion of 80 to 1 seems to be a desirable substitute for morphone or pethidine alone in the treatment of pain in patients with severe respiratory disease, and since no reference in the literature can be found for this use of the mixture we hope that our findings will be of interest.

T. G. JUDGE
J. H. ROLLAND RAMSAY
C. KELMAN ROBERTSON.

Industrial Chest Unit,
Bangour Hospital,
West Lothian.

## FRACTURES OF TIBIA AND FIBULA

SIR,—The method of holding certain fractures of the leg over wedges described by Mr. David Thomas in your issue of June 4 is not new, having been described by Mr. E. A. Nicoll of Mansfield some years ago; but it is, like all simple procedures, an excellent method in practice. Many transverse fractures of the tibia are so stable after reduction that only the one wedge under the knee is needed if the leg is allowed to fall into external rotation.

Ashford Hospital,
Ashford, Middlesex.

F. GODSALVE WARD.

## GRANTS TO STUDENTS

SIR,—It was to be hoped that having raised the subject of university awards in your annotation Backed by the Community (June 18), you would have found it possible to express an outright opinion in favour of the abolition of the present parental means test. This measure particularly hits members of our profession who work harder than most others and have a struggle to maintain a standard of living proportionate with our efforts and responsibilities. After paying income-tax and perhaps surtax, we now have in many cases to pay full university fees, board, &c., even although our children may be clever enough to qualify for a State scholarship. The net result is to double-tax our incomes and we end up a good deal worse off than the "less fortunate" in the so-called lower income groups.

Many parents in present circumstances cannot afford to send more than one child to university. Other children equally talented suffer through no fault of their own and it is probable that the nation can ill afford to lose them. Your remarks about other ladders will not convince many.

One has heard of young men who have got to university only through the death of their fathers, this making them eligible for a grant. This is a sad commentary on the present system. Mention the word "means test" to some of our political friends and they almost have apoplexy—but of course this is different.

The abolition or at least drastic reform of this system is more important to the majority of middle-aged and young doctors, who have or will have children to educate, than any amount of controversy over drugs for private patients or possible methods of allocation of merit awards.

Middlesbrough. B. H. ELLIS.

*** The Committee on University Grants was divided on the abolition of parental contributions. In our annotation we tried to summarise the case put forward by each group. (The phrase "some other ladder" is a quotation from p. 56 of the report.) Our feeling that these contributions should be abolished is longstanding (*Lancet*, 1958, i, 1286).—ED. L.

## ÆTIOLOGY OF KURU

SIR,—A number of recent publications in *The Lancet* and other journals have left the impression that the evidence is very strong for a genetic ætiology of kuru, a fatal degenerative disease of the central nervous system found among the Fore tribe of New Guinea, in spite of the cautiousness of the investigators in stating a hypothesis of genetic ætiology only tentatively. Kuru has been said largely to attack children and adult females, while rarely attacking adult males.

The negative evidence for the genetic ætiology of kuru is considerable and has not been stressed. Stated briefly, such negative evidence is:

(1) Women from kuru-free groups have acquired the disease after marrying into the Fore tribe.[1]

(2) The mutation-rate required to explain such a high frequency of the disease in the population is much greater than the known mutation-rates for other pathological genes. Investigators say that as much as 1% of the population was suffering from the disease during a period of investigation lasting for several months. The disease usually runs its fatal course in eight to nine months.

(3) Data from one publication [2] indicate that of 33 maternal grandmothers of kuru victims, 15 died of kuru, while of 31 paternal grandmothers of victims, only 2 died of the disease. If, as the investigators have suggested, the male heterozygotes carry kuru without expressing it, while female heterozygotes are victims in adulthood, then children should be at least as likely to get the gene from their father as from their mother, and in turn from their paternal grandmother as their maternal grandmother. This occurrence of the disease among grandmothers has a probability of happening by chance less than once in a thousand times.

(4) In an early publication Gajdusek and Zigas [3] give some indication that the disease may be of recent origin. At a later date, Klatzo et al.[4] give the impression that the disease has been present for a long time. If there is any possibility that the disease is recent, the issue must be settled before the genetic hypothesis can be accepted, since the frequency of the disease in the population is too great to be accounted for by a disease of recent genetic origin.

(5) A few alleged recoveries are reported.[5] If there are recoveries, a genetic explanation would seem unlikely.

With our present knowledge of genetics, we cannot accept kuru as a genetic disease unless it can be shown, as some of the investigators have argued, that an extremely unstable chromosome locus along with, perhaps, a mutagenic factor exists in the Fore environment, or that some selective advantages which have not yet been identified are working in the reproductive favour of individuals carrying the kuru gene. One of the important problems in the investigation of the genetic ætiology of such a disease

1. Gajdusek, D. C., Zigas, V. *Amer. J. Med.* 1959, **26**, 461.
2. Bennett, J. H., Rhodes, F. A., Robson, H. N. *Amer. J. hum. Gen.* 1959, **11**, table 11, p. 184.
3. Gajdusek, D. C., Zigas, V. *Amer. J. Med.* 1959, **26**, 461.
4. Klatzo, I., Gajdusek, D. C., Zigas, V. *Lab. Invest.* 1959, **8**, 799.
5. Gajdusek, D. C., Zigas, V. *Amer. J. Med.* 1959, **26**, 450.

would be to identify the large number of male heterozygotes who would have to be carrying the gene, and to show beyond a doubt that they can pass on the gene to their progeny.

On the other hand, the Fore society presents such a clear-cut possibility for an environmental agent to attack women and children and by-pass adult males, that it would seem difficult to abandon the possibility of an environmental ætiology resulting from a toxin, virus, or deficiency. The anthropological investigations of Berndt [6] indicate that, if there is one significant fact about Fore society, at least up to the recent past, it is the marked separation of men on the one hand and women and children on the other, in almost every phase of life, including dwelling houses.

School of Tropical Medicine and Public Health. ANN FISCHER.

Department of Sociology and Anthropology, Tulane University, New Orleans, Louisiana. JOHN L. FISCHER.

## A CHLOROFORM SYNDROME?

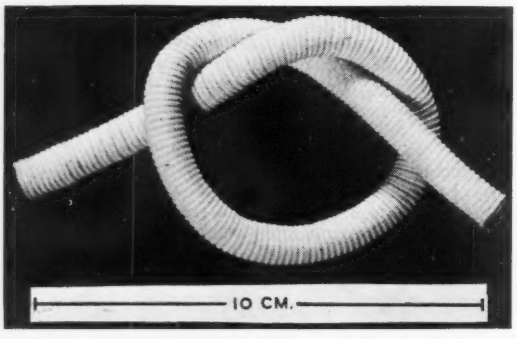
SIR,—From continued observation of a case which has come to my notice it seems that there is a "chloroform syndrome". Repeated exposures to this inhalant anæsthetic for eighteen months or more have gradually produced symptoms and clinical signs which may indicate (1) an individual hypersensitivity to the material, (2) a toxic effect primarily on liver, kidneys, and myocardium, but also affecting the pituitary and suprarenal, or (3) a more specific ganglion-blocking or even cell-destructive effect on sympathetic ganglia and chromaffin tissue. A year or more may elapse before the case can be presented in full for publication.

Meanwhile, Sir, may I ask for details of cases and/or the views of your readers who have come across any untoward effects following repeated exposure to chloroform vapour?

59, Walnut Tree Walk, London, S.E.11. H. A. L. O. LATTA.

## A NEW ARTERIAL PROSTHESIS

SIR,—A new type of arterial prosthesis (see figure) has recently become available. It is of British design and




manufacture, being made entirely from Courtaulds high-melting-point polyethylene fibre (Courlene 'X3').

In order to provide flexibility and slight elasticity, it is woven in the form of a double helical spring and may be autoclaved if the temperature during this process is not allowed to exceed 118°C; boiling or cold sterilisation with any suitable solutions are alternative methods of preoperative preparation. The prosthesis must be divided with the cool cautery in order to seal the fabric, but this done, the ends of the tube provide a powerful hold for sutures. Pre-clotting of the prosthesis is desirable.

Extensive experimental investigation of these synthetic grafts has been carried out. Courlene X3, being a pure polyethylene, causes minimal tissue reaction and loses none of its strength after periods of over 12 months in the body—factors which might be anticipated from its chemical constitution.

These prostheses are made by P. Davenport Ltd. (Macclesfield) and are now available through the Genito-Urinary Manufacturing Co. Ltd.

Department of Surgery, The University, Sheffield. B. N. CATCHPOLE.

6. Berndt, R. M. *Sociologus*, 1958, **8**, 4.

## CONFIRMATORY MEDICAL CERTIFICATE BEFORE CREMATION

SIR,—I endorse Dr. Hinden's criticism (June 18) of the inadequacy of the confirmatory medical certificate in regard to question 3 which asks "Have you made a post-mortem examination?" This is, however, but one of several shortcomings of the statutory form which has led me recently to inquire to what extent an individual cremation authority may be enabled to revise it.

There is, for instance, the question on Form B relating to the inspection of the body after death which asks "What examination of it did you make?" This elicits an extraordinary variety of answers few of which are of material assistance to the referee. There is also a lack of any suitable question which enables a practitioner to insert helpful information in regard to clinical history in support of the stated cause of death.

It is, of course, very much easier to point out the inadequacy of a form than to devise a new one, but I would have little doubt that a panel of medical referees could draw up something much simpler and more to the point than the existing one.

It seems possible in the meantime for cremation authorities to make provision for additional information to be given, but it would not appear possible for the statutory questions to be altered in any way without amending legislation.

K. O. A. VICKERY
Medical Referee,
Eastbourne. Eastbourne Crematorium Authority.

SIR,—Has it occurred to Dr. Hinden that the person best qualified to sign the second part of the cremation certificate is the pathologist performing the autopsy?

Pathological Laboratory, Southlands Hospital, Shoreham-by-Sea, Sussex. K. S. RODAN.

SIR,—I entirely agree with Dr. Hinden. In answer to question 3. "Have you made a post-mortem examination?" "Not personally, one performed", should suffice. At least it would tell the medical referee that a post-mortem was carried out.

Manchester. I. A. KELLOCK.

SIR,—There is an easy way out for Dr. Hinden. The pathologist who has performed the postmortem is the best person to complete the second medical certificate.

In addition, it has been recommended that the second certificate should be given by a person other than one who has had the deceased in his care.

Cardiff. R. C. R. CONNOR.

SIR,—May I suggest two solutions to Dr. Hinden's problem? He could ask the morbid anatomist to complete the confirmatory certificate, or he could visit the post-mortem room and have a look at the findings. I am sure the morbid anatomist would make Dr. Hinden welcome and assist, if necessary, in interpretation. Dr. Hinden would then be correct in saying that he had performed a

postmortem examination. A knife is useful in exposing organs for examination and helps to determine consistency, but one can examine with one's eyes.

The Radcliffe Infirmary, Oxford. R. H. COWDELL.

# Parliament

## QUESTION TIME

### "Spiritual Healers" in Hospital

Mr. KENNETH ROBINSON asked the Minister of Health what guidance he had given to hospital management committees regarding the admittance of members of the National Federation of Spiritual Healers into hospitals for the purpose of treating National Health Service patients; and how many management committees permitted these activities at the present time.—Mr. DEREK WALKER-SMITH replied: I have not given guidance to hospital management committees, as I consider on present advice that the visiting of patients is a matter which should be left to the hospital authority's discretion, in the light of the views of the doctor in charge of the particular patient who has asked for the visit. While I do not know the practice of individual committees, they are generally aware of my view.

Dr. DONALD JOHNSON: Is the Minister aware that the Federation of Spiritual Healers are making extensive claims in this matter and are saying that they are entering hospitals to give treatment by permission of the regional hospital boards? Does he not agree that, if this is so, it is a matter for his decision and not one to be left to the regional hospital boards? We look to him for guidance and a decision in the matter.—Mr. WALKER-SMITH: I have no responsibility for any claims made by this Federation or any other body. There are two requisites here: first, that the patient must ask for any such visit before it can be contemplated, and, secondly, that the hospital authority must exercise its discretion with due regard to the views of the doctor in charge of the case.

Mr. ROBINSON: I do not want to express a view one way or the other about the merits of the Federation, but does not the Minister think that this is a matter in which he should give guidance to hospital authorities rather than leave the decision to individual authorities? Is he aware that these healers are now reported to be present in 50% of the hospitals run by management committees?—Mr. WALKER-SMITH: If I am right as to the factors governing these cases, it must always ultimately be a matter for local decision, in the light of these factors. Therefore, general guidance, beyond what I have already said, would not appear to be appropriate. Dr. EDITH SUMMERSKILL: Did I understand the Minister to say that a regional hospital board can make a decision in favour of these visits but that a doctor can refuse only in a specific case. Can a doctor refuse to have a spiritual healer attending any of his cases on the ground of principle?—Mr. WALKER-SMITH: The question does not arise in the first place unless and until the patient concerned asks for the visit. That having been done, it is a matter for the discretion of the hospital authority whether or not the visit will be sanctioned. In coming to that decision the hospital authority will give due weight to the opinion of the doctor in charge of the case.

### Tests for New Drugs

Mr. GEORGE DARLING asked the Minister if he would introduce regulations to require that all new drugs be tested and evaluated by a responsible body before they are offered for sale to the public.—Mr. WALKER-SMITH replied: While there are no existing powers under which such regulations could be made, I am giving, and will continue to give, all the help and encouragement I can towards improvements in the present arrangements and facilities for clinical trials. The Central and Scottish Health Services Councils have agreed to extend the terms of reference and membership of the Standing Joint Committee on the Classification of Proprietary Preparations to enable this committee to assist.

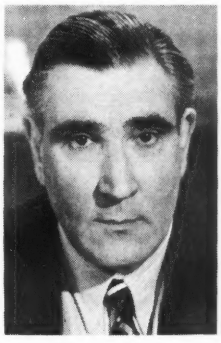
# Obituary

## ALEXANDER KENNEDY

M.D. Lond., F.R.C.P., F.R.C.P.E., D.P.M.

Dr. Alexander Kennedy, whose death on June 11 we announced last week, had held the chairs of psychological medicine at Durham and Edinburgh. He came to both departments at a time of reorganisation, and perhaps his chief contribution to psychiatry was the development of these professorial units in the light of his own ideas, and the integration of the teaching of psychiatry with the other disciplines of medicine.

He was born in 1909 and was educated at the City of London School and St. Thomas's Hospital, where he qualified in 1932. After holding house-appointments there he took his M.D. and the M.R.C.P. in 1934 and specialised initially in pædiatrics. He continued his postgraduate studies at the Johns Hopkins University, and in 1936 he was awarded a Rockefeller travelling fellowship in neuropsychiatry. On his return to this country he became medical officer in charge of the children's department at the Maudsley Hospital, while the present children's hospital was being built with the assistance of the Rockefeller Foundation. In 1938 he was awarded the gold medal of the Royal Medico-Psychological Association. During the late war he carried out research into the psychology of parachute and commando training and took part in operations in the Western Desert, Crete, Greece, and Yugoslavia. Later, with the rank of lieut.-colonel, he was appointed head of a department dealing with the psychological aspects of military intelligence and subversive operations and was an adviser on scientific intelligence in Germany. After the war he returned to the Maudsley Hospital as senior physician and joined the staff of the Maida Vale Hospital for Nervous Diseases. In 1947 he was appointed to the chair of psychological medicine at Durham. He was also physician to the Royal Victoria Infirmary, Newcastle upon Tyne, and clinical director of psychiatric units in the regional mental health service. In 1949 he was elected F.R.C.P. He was appointed to the Edinburgh chair five years ago.



*Feature Press Photo Agency*

Even a formal biography shows that Kennedy was an unusual man who had an unusual career. Exactly how unusual and how effective is made clear only by the following memoirs from his friends:

I first met Alexander Kennedy in 1946 when he had returned to the Maudsley Hospital after an exciting, if not lurid, career in the Army. Thenceforth his adventures, his successes, and his life have been a never-failing source of pleasure to me. I have always come away from him feeling happier, amused, and more able to bear with the workaday world of psychiatry. It has been said that he told tall stories. Yet as I became closer to him, I found them confirmed on every side. Life was with him stranger than fiction, the result of his adventurous turn of mind and his zest for new experience. At one time a gambler on the Paris bourse in hectic post-war days, at another the familiar of desert sheikhs, sharing their mutton stews on the road to Mecca, yet again the author of immensely successful radio plays and member of the Brain's Trust of television—these were all roles Kennedy had played. He could do these things because there was about him a simple directness which brooked no awareness of "east nor west, border, nor breed, nor birth", which was his most outstanding characteristic.

To see him purely as a doer would be entirely wrong, however; he had one of the best brains in psychiatry. To examine with him, particularly if there was a good candidate, was a delight. He was an accomplished lecturer, and his numerous papers are all marked by both clarity and learning. But his learning was never recondite or produced for effect; it was a natural part of him. He had built up one university department, and was busy building up the chair at Edinburgh when he died. The peculiar problems inherent in the formation of a new, and yet major, department of medicine must ultimately depend for their solution on the character of the professor. When the history of post-war psychiatry in Great Britain comes to be written, Kennedy will have an important place, for his work at Newcastle broke new ground. He was the right man at the right time. It is a tragedy that we cannot see his ideas further developed. D. L.

When Alexander Kennedy came to Newcastle as our first professor of psychological medicine, undergraduate instruction in psychiatry traditionally comprised a course of didactic lectures and an occasional dreary perambulation round the local mental hospital, mainly dedicated to the demonstration of a few cases of advanced insanity. Of postgraduate education or research in psychiatry there was none. When he left us for Edinburgh his successor inherited a highly organised, well-staffed, well-equipped, and vital department which had built up a fund of good will both within the medical school and outside it. All this Alex achieved by a highly personal combination of sweet reasonableness, persuasion, bullying, horse-trading, and frank intrigue—which he relished. During this short period Kennedy initiated a psychiatric consultative service of exemplary quality in the Royal Victoria Infirmary, as well as a splendid electroencephalographic department, and fathered the beginning of academic neurology as a separate discipline under his roof. But he was active also in the region, where his enlightened energy furnished the motive power for a transformation of some of the most backward mental hospitals in the country into a group of institutions where patients could benefit fully from the current revolution in psychiatric treatment.

These utilitarian preoccupations were a far cry from Flexner's initial conception of the role of the full-time clinical professor, but Kennedy had more excuse than most of his academic contemporaries for his absorption in organisation and administration to the virtual exclusion of personal research. He found psychiatry in the dark ages, and until the machinery for its prosecution had been assembled it was useless to think in terms of technical development: he was building for the future.

As a teacher he was enormously popular—enthusiastic, histrionic, confidential, scandalous, and full of vivid illustrations drawn from his various and colourful experiences in the worlds of boxing, dirt-track riding, the Army, the Middle East, big business, the B.B.C., and that demimonde of psychopathy and drug addiction which clearly fascinated him as much as it did his listeners. But when he quietly gave his mind to a complicated clinical problem he was a most percipient diagnostician, with a flair for organic psychiatry. And when his sympathies were engaged he was the kindest of doctors and the most understanding of men, often indeed manifesting a vein of indulgent soft-heartedness which contrasted strikingly with the braggadocio of his usual manner. However, the fact that nobody could have looked less like a psychiatrist was undoubtedly one of his natural advantages, and under the influence of his robust bonhomie and astringent commonsense, even surgeons came to take account of his subject.

Everything about Alexander Kennedy was larger than life—he was vital, passionate, ingenious, and infinitely versatile. His chronic ill health, borne with bravery and humour, was known to all his friends, but his sudden loss was no less unexpected and tragic. He was a most lovable man.

H. G. M.

Physically the large frame and characteristic walk of Alex Kennedy was conspicuous in any company, and when we travelled as students on the London trams he was never charged a fare, for the conductor assumed he was a policeman in plain clothes. He was outstanding as a fighter, boxing heavy-weight, and in a sense fighting was an essential part of his life; perhaps it had had to be. When dirt-track racing was introduced, Alex paid some of his way through hospital with his earnings on the track. Despite these less conventional activities, he was a brilliant student and swept up most of the available medical prizes. As a houseman, his fighting took the form of battling for various political causes, partly because of the opportunity for physical encounter they afforded. He would get a telephone call while working in the laboratory and disappear to the East End, returning some hours later with fractured metacarpals; such heavy odds he enjoyed. In the locust years and during the war I saw him only occasionally until he came to Edinburgh to the chair of psychological medicine. "What will happen", one famous London physician is reported to have asked, "when an irresistible force meets an immovable object?" What did happen the colleagues in his own specialty can best say, but to the general physician what was so welcome was his ambition to integrate his specialty with the general medicine from which it has for too long been divorced and his readiness to forward any projects towards that end. His memorial, and it is the only memorial he would have cared about, will be the realisation of his proposals for the place of psychological medicine in the Edinburgh of the future—a realisation he knew he would never see for himself. For the rest of us, if we could capture but some of his zest for life, his tenacity of purpose, his humanity, and his own brand of special courage, we shall not do so badly.

W. I. C.

## WILLIAM SCOTT PATTON

M.B. Edin.

Dr. W. S. Patton, emeritus professor of entomology in the University of Liverpool, died on May 26 at the age of 83.

He was born at Hyderabad, the son of William Patton, J.P., and was educated at Stokes School at Mussoorie. He studied medicine at the Universities of Edinburgh and Marburg, and a year after he qualified in 1901 he joined the Indian Medical Service. After spending some years with the Aden Boundary Commission studying malarial parasites, he was appointed to the King Institute of Preventive Medicine in Madras to carry out a special investigation into the ætiology of kala-azar. Later he was promoted assistant director of the institute and undertook research into oriental sore. During the 1914–18 war he served as entomologist to the Mesopotamian Expeditionary Force. On demobilisation he worked as director of the Pasteur Institute at Coonoor. In 1921 he moved to Edinburgh as lecturer in medical entomology, but three years later he returned to Asia when he was selected by the Royal Society as director of their kala-azar commission in Northern China. In 1927 he was appointed to the chair of entomology in Liverpool, and he remained there till ill health forced him to retire in 1937. The following year he was awarded the Mary Kingsley medal of the Liverpool School of Tropical Medicine.

Besides his classical studies on kala-azar and oriental sore Patton wrote on hæmogregarines, on the development of *Herpetomonas culicis*, a parasite of the mosquito, on a new piroplasm (*P. gibsoni*) in foxhounds, on flagellates of the genera *Herpetomonas*, *Crithidia*, and *Rhynchoidomonas* (1912), and on the arthopods of medical and veterinary importance in Mesopotamia (1920). His *Textbook of Medical Entomology* with F. W. Cragg has been described as the *Debrett* of the entomological world ("If it is not in Patton it is not worth while").

P. H. M.-B. writes:

"The name of W. S. Patton conjures up memories of a controversial figure. He, almost more than anyone, was the father of modern tropical entomology. His scientific output

was stupendous and his zeal almost fanatical. I can see him still with blazing eyes and vigorous gestures at meetings of the Royal Society of Tropical Medicine in Chandos Street. There he held the stage and with oratory stirred and prodded the medical hierarchy in India into action. Patton was indeed part and parcel of India and the love of its people was in his blood. Despite opposition and criticism there can be no doubt that his considerable work on kala-azar eventually led to the final and conclusive victory by Shortt and his colleagues in 1942 and 1943."

On his retirement he lived in Devon, and he died in Bideford Hospital after a fall. He is survived by five sons and his widow, who contributed beautiful drawings to all his books.

### JOHN INKSTER

M.D. Aberd., F.R.C.P., D.P.H.

Dr. Inkster, who died on June 15, was known and valued as a general physician in Middlesbrough and the North-East of England, where he was in consulting practice for nearly forty years.

He was born in Aberdeen in 1888 and was educated at the grammar school and university of the city. After qualifying in 1909 he held resident posts in London at Victoria Park Chest Hospital and at Great Ormond Street. During the 1914–18 war he served with the R.A.M.C. in France and Salonika. After his demobilisation with the rank of major he spent some time in postgraduate study, taking the M.R.C.P. in 1920, before settling in Middlesbrough. His work was centred on the North Ormesby Hospital, but he also served several other local hospitals as pathologist and physician. He was elected F.R.C.P. in 1941.

B. W., a colleague in Middlesbrough, writes:

"Dr. Inkster's work was quiet and unobtrusive, and he had few interests outside medicine, except for great enthusiasm for Freemasonry. He had very strong loyalties, especially to Aberdeen, the R.A.M.C., and the College of Physicians. He did much to make the changing-over at the time of the introduction of the National Health Service harmonious. He was also an early and keen supporter of the body which eventually became known as the Regional Hospitals Consultants' and Specialists' Association."

W. W. J., who qualified with him in Aberdeen in 1909, relates:

"We regarded, and treated, John Inkster as the baby of our class. He looked younger than most of us and in his rather precise way he retained his boyish appearance for most of his life. He was very gentle and deliberate in manner, never hurrying when answering a question but often quickly intervening to correct an inaccurate statement. He was a good friend, full of fun, and ever ready to see the humorous side of anything. Military service appealed to him, and he early joined the special reserve of officers, serving in the R.A.M.C. with distinction during the first world war. He was just as well-informed and meticulous in matters of military procedure as he was in matters medical, and no-one ever saw him improperly dressed when in uniform. Indeed in his early days he had his hair cut regularly at Truefitt's in Bond Street, which he regarded as the only place worthy of an officer's patronage. There was little prospect of his making a living in London so he moved to Middlesbrough, where Dickie, who was surgeon there, advised him there was need for a physician. And in Middlesbrough John Inkster spent nearly the whole of his professional life practising as a consulting physician and providing the standard of service one would expect from a man of his ability and high principle. His work kept him tied to the North Country but he often attended—and much enjoyed—the informal dinners at the Royal College of Physicians. He was a most lovable person who served his profession well."

Dr. Inkster is survived by his widow, two daughters, and a son, who is a consultant anæsthetist in Newcastle upon Tyne.

# Notes and News

## SOMATIC WARDS IN MENTAL HOSPITALS

TOWARDS the end of 1958 an experiment was launched in the Swedish Ulleraker mental hospital about which Dr. N. B. Nordlander has a tale to tell.[1] Wards with 15 male and 15 female beds were equipped up to the standard of a modern general hospital and staffed by personnel trained to grapple with somatic as well as psychiatric ailments. These wards were visited by specialist surgeons and physicians, as well as by the hospital's psychiatric staff. Some of the patients had come from the psychiatric side of the hospital, having qualified for admission to one of the somatic wards by developing a somatic ailment such as pneumonia. Others had been admitted from without the hospital, again with some somatic complaint. Many were old folk whose physical disorders had triggered off mental disturbances. Operations, for example, had often had this effect; and the 210 men and 153 women cared for in these wards in 1959 included as many as 64 postoperative cases. The largest group (78 cases) was composed of patients presenting diagnostic problems—the case requiring a neurologist to discover some organic disease of the brain masquerading as insanity, the obscure case of anæmia, the possible cancer case, the victim of a nutritional disturbance, the patient with pyrexia of unknown origin, and so on. As many as 41 cases were listed as infections, and among these were nosocomial infections requiring special facilities for isolation. Cardiac decompensation was noted in 34 cases, and arteriosclerotic complications in 27. Delirium tremens accounted for 23 cases.

### University of Cambridge

On Oct. 1 a Mary Marshall professorship of the physiology of reproduction and a professorship of chemical microbiology are to be established. Dr. A. S. Parkes, of the National Institute for Medical Research, London, has been appointed Mary Marshall professor and Dr. E. F. Gale, director of the Medical Research Council chemical microbiology research unit at the University of Cambridge, professor of chemical microbiology. Both appointments are limited to one tenure.

On June 11 the following degrees were conferred:

*M.D.*—C. W. M. Adams, P. J. Dawson, H. B. Eckstein, R. W. Payne.
*M.B., B.Chir.*—George Willett (by proxy).
*M.B.*—D. R. F. Clark, R. B. Church.

### University of London

Dr. H. Harris, reader in biochemical genetics at the London Hospital Medical College, has been appointed to the chair of biochemistry at King's College.

Dr. Harris, who is 40 years of age, was educated at Manchester Grammar School and the University of Cambridge, taking the degree of B.A. in 1941. After qualifying in 1943 he held a house-appointment at Sunderland Royal Infirmary. After his National Service in the R.A.F. medical service he spent 1947 to 1950 as an honorary research assistant at the Galton Laboratory of University College, London, while holding a Leverhulme scholarship of the Royal College of Physicians and a Lund fellowship of the Diabetic Association. In 1950 he was appointed to a lectureship at University College. Three years later he became senior lecturer in the department of biochemistry at the London Hospital Medical College, and was appointed reader in 1958. His published work has mainly been concerned with the biochemical aspects of human genetics.

Mr. A. F. Huxley, reader in experimental biophysics in the University of Cambridge, has been appointed to the Jodrell chair of physiology at University College.

### University of Wales

At recent examinations the following were successful:

*D.P.H.*—D. J. W. Anderson, J. N. Bodger, J. L. Davies, D. C. Dymond, C. E. Edwards, T. L. Jones, Peter Lavis, P. C. Moore, I. D. G. Richards, Enid C. Vincent.

*D.T.C.D.*—Syed Zafar Ahmad, Bhalchandra Nilkanth Bapat, Sudarsan Bejoy Barua, Thadar Chakorn, C. Chin Hin Chew, Dwarka Nath Gupta, Abdul Khaliq, Peter Macpherson, Maung Hla Maung, G. D. Murphy, Hari Anugrah Narain, Balasupramaniam Ponniah, Vijaya Chandra Ratnesar, Jamil Ahmad Siddiqui, Ibrahim Taha.

1. *Svenska Läkartidn.* May 13, 1960.

### Royal College of Surgeons in Ireland

At a meeting of the college on June 7 the following officers were elected:

President, T. G. Wilson; vice-president, N. A. Kinnear; council, R. Atkinson Stoney, J. F. Devane, A. A. McConnell, T. O. Graham, A. B. Clery, Ian Fraser, T. Millin, M. P. Burke, R. R. Woods, E. N. MacDermott, J. H. Coolican, D. J. Riordan, J. G. Mathews, J. P. Lanigan, F. A. J. M. Duff, D. Montgomery, S. T. McCollum, J. M. McAuliffe Curtin, E. O'Malley.

On June 16 the fellowship of the college was conferred on the following:

M. T. D. Braide, J. F. Doyle, P. B. Kiely, Hosny Abd-el-Maksoud Mostafa, R. W. Pigott.

### Society of Apothecaries of London

On Tuesday, June 28, at 8.30 P.M., Sir Tudor Thomas will be presented with the society's gold medal in therapeutics in recognition of his services to corneoplastic surgery.

### Royal Medical Foundation of Epsom College

The annual general meeting of the governors of Epsom College will be held at the Medical Defence Union, Tavistock House South, London, W.C.1, on Wednesday, July 13, at 3.30 P.M.

### World Medical Association

The General Assembly will be held in Berlin from Sept. 16 to 22. Further particulars may be had from Bundesärztekammer-Kongressbüro, Köln-Lindenthal, Haedenkampstr. 1, Germany.

### International Symposium on Cori's Ester

This symposium will be held in Milan from Sept. 16 to 18 under the presidency of Prof. Carl Ferdinand Cori. Further particulars may be had from the secretary of the organising committee, Via Modica, 6, Milan, Italy.

### Appeal against G.M.C. Dismissed

On June 20 the judicial committee of the Privy Council dismissed Dr. Kenneth Fox's appeal against the decision of the disciplinary committee of the General Medical Council ordering the erasure of his name from the Medical Register (see *Lancet*, 1959, ii, 1024).

### World Standards for Protective Helmets

On the initiative of the British Standards Institution, the Protective Headwear Manufacturers Association, and other safety interests, a new committee of the International Standards Organisation has been set up to discuss world standards for the quality and testing of safety helmets. The committee holds its first meeting at British Standards House in London from Oct. 12 to 14.

### Restricting Medical Immigrants to U.S.A.

From July 1 graduates of medical schools in their own country will have to pass a test on medical knowledge and their grasp of the English language (*New York Times*, June 8, 1960) before they can obtain a hospital appointment in the United States. At present they can either take the test at home or after arriving in the United States. Some 3300 foreign medical graduates reach the United States each year, and it is expected that the new regulation will halve the number.

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Mr. John Boyd-Carpenter, Minister of Pensions and National Insurance, has asked the National Insurance Advisory Committee to consider four sets of draft regulations designed to implement their recent report on long-term hospital patients. Representations should be sent in writing to the secretary of the committee, 10, John Adam Street, London, W.C.2, not later than July 15.

The Committee on the Problem of Noise, appointed by the Minister for Science, is now ready to receive evidence. Anyone wishing to give evidence should first write to the committee's secretary, Mr. R. S. Matthews, Ministry of Health, Savile Row, London, W.1.

The Biochemical Society will hold a meeting on Wednesday and Thursday, June 29 and 30, at 10 A.M. each day in the department of biochemistry, University of Cambridge.

## Diary of the Week

JUNE 26 TO JULY 2

**Monday, 27th**

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Dr. Brian Ackner: Aches and Pains of Psychogenic Origin.

**Wednesday, 29th**

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Endocrinology*. Dr. John B. Stanbury (Boston): Constitutional Factors in Thyroid Disease.
POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Dr. R. W. Riddell: Diseases Due to Fungi.
ROYAL FREE HOSPITAL, Gray's Inn Road, W.C.1
5.15 P.M. Dr. Seymour S. Kety (Bethesda): Current Biochemical Concepts of Schizophrenia.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. Riddell: Histopathology of Fungus Infection.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Mr. D. S. M. Barlow: Surgical Problems of Hiatus Hernia and Other Diaphragmatic Herniæ.

**Thursday, 30th**

POSTGRADUATE MEDICAL SCHOOL OF LONDON
4 P.M. Dr. J. F. Goodwin: Rare Disorders of Heart Muscle.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Mr. A. K. Monro: Malignant Melanoma, Clinical and Pathological.
NUFFIELD ORTHOPÆDIC CENTRE, OXFORD
8.30 P.M. Dr. Isidore Conn (Tulane): Rudolph Matas, the Pioneer of Vascular Surgery.

**Friday, 1st**

POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Prof. John Bruce: Cancer of the Breast.

**Saturday, 2nd**

BRITISH ASSOCIATION OF ALLERGISTS
10 A.M. (Wright-Fleming Institute, St. Mary's Hospital, W.2.) Short Papers.

## Appointments

HARGREAVES, ELIZABETH M., M.B. Leeds, D.P.H.: assistant M.O. and school M.O., Wetherby division, West Riding of Yorkshire.
KINNEAR, W. F., M.B. St. And., D.O.M.S.: part-time consultant ophthalmologist, hospitals and school clinics, Scunthorpe, Gainsborough, and Brigg areas.
WILD, DAVID, M.B. Manc., D.OBST., D.P.H.: senior M.O., West Sussex.
WOOD, P. R. T., M.B. Lond.: assistant county and school M.O., Horsham and Crawley areas, Sussex.

**Leeds Regional Hospital Board:**

AGNEW, R. A. L., M.D. Dubl., M.R.C.P.I.: assistant psychiatrist (S.H.M.O.), Broadgate Hospital, Beverley.
ROPSCHITZ, D. H., M.D. Genoa, D.P.M.: consultant in psychiatry, Storthes Hall Hospital, Huddersfield.
ROSENTHAL, LEONARD, M.D. Leeds: consultant in geriatrics, Wharfedale/Leeds area.
TUPMAN, G. S., M.B., B.SC. Manc., F.R.C.S.: part-time consultant in orthopædic surgery, Scarborough, Bridlington, and Whitby areas.

**Liverpool Regional Hospital Board:**

BREARLEY, ROGER, CH.M. Lpool, F.R.C.S.: part-time consultant general surgeon, Whiston Hospital.
GARRETT, M. J., M.B. N.U.I., F.F.R., D.M.R.T.: consultant radiotherapist, radiotherapy service.
JARVIE, H. F., M.D., B.SC. Glasg., D.P.H., D.P.M.: part-time consultant psychiatrist, Sefton General and Royal Southern Hospitals.
MACSORLEY, D. T., M.B. N.U.I., D.P.M.: assistant psychiatrist, Ormskirk County Hospital.

**Wessex Regional Hospital Board:**

BARTON, GWENDOLEN M. G., M.D., B.SC. Lond., M.R.C.P.: consultant pathologist, Salisbury group of hospitals.
BELCHER, H. L., O.B.E., M.R.C.S.: part-time consultant in venereal diseases, St. Mary's Hospital, Newport, Isle of Wight.
MICHELL, R. C., M.B. Lond., M.R.C.P., F.F.R., D.M.R.D.: part-time consultant radiologist, Winchester and Alton groups of hospitals.

**Colonial Appointments:**

BOYE-JOHNSON, D. E., L.M.S. Nova Scotia, D.T.M. & H., D.P.H.: principal M.O., Sierra Leone Ministry of Health.
BUTTER, M. N. W., M.D. Amsterdam: M.O., Northern Region of Nigeria.
CHANDRA, F. A., M.B. Lond., D.P.H.: medical superintendent, Leprosy Hospital, British Guiana.
CONNOLLY, JOSEPH, M.B. Lond., D.OBST., D.C.H.: M.O., Bermuda.
CRAIG, J. K., M.B.E., M.D. Dubl., D.P.H., D.C.H.: assistant chief M.O., Kenya.
CUMMINGS, E. C., M.B. Durh., D.T.M. & H., D.P.H.: senior M.O. (health), Sierra Leone.
FRANKLIN, G. C., M.B. Cantab., D.P.H.: assistant director, medical and health services, Hong Kong.
KUIPERS, F. H., M.D. Amsterdam: M.O., Northern Region of Nigeria.
MANDAL, B. N., M.B., D.T.M.: M.O. (pathologist), Federation of Nigeria.
MITRA, SUKUMAR, M.D. Patna, M.R.C.O.G.: surgeon specialist, Sierra Leone.
THOMAS, A. H. E., M.B. Dubl., D.P.H.: senior M.O., Sierra Leone.

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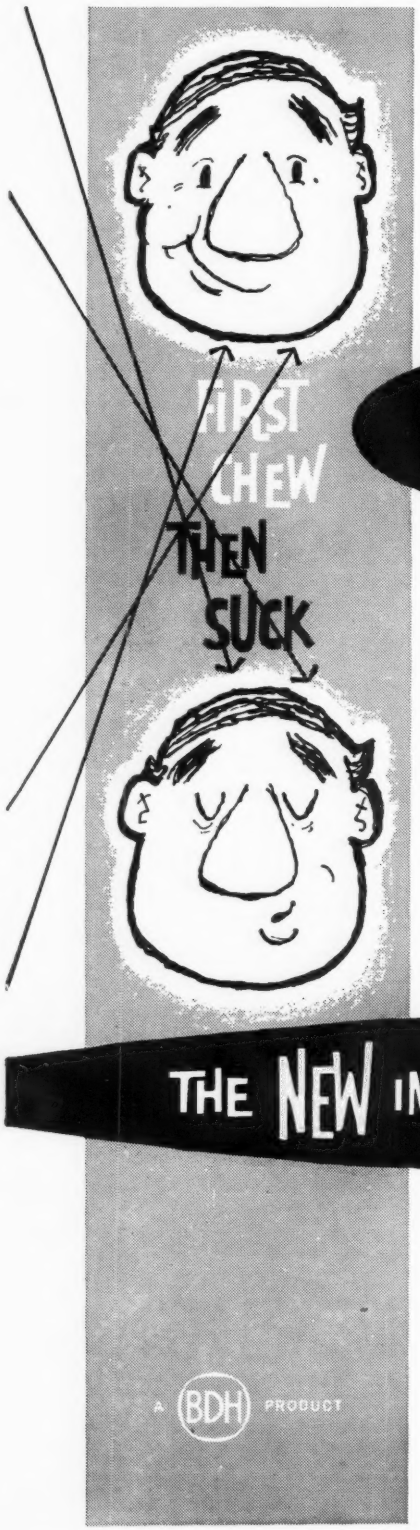


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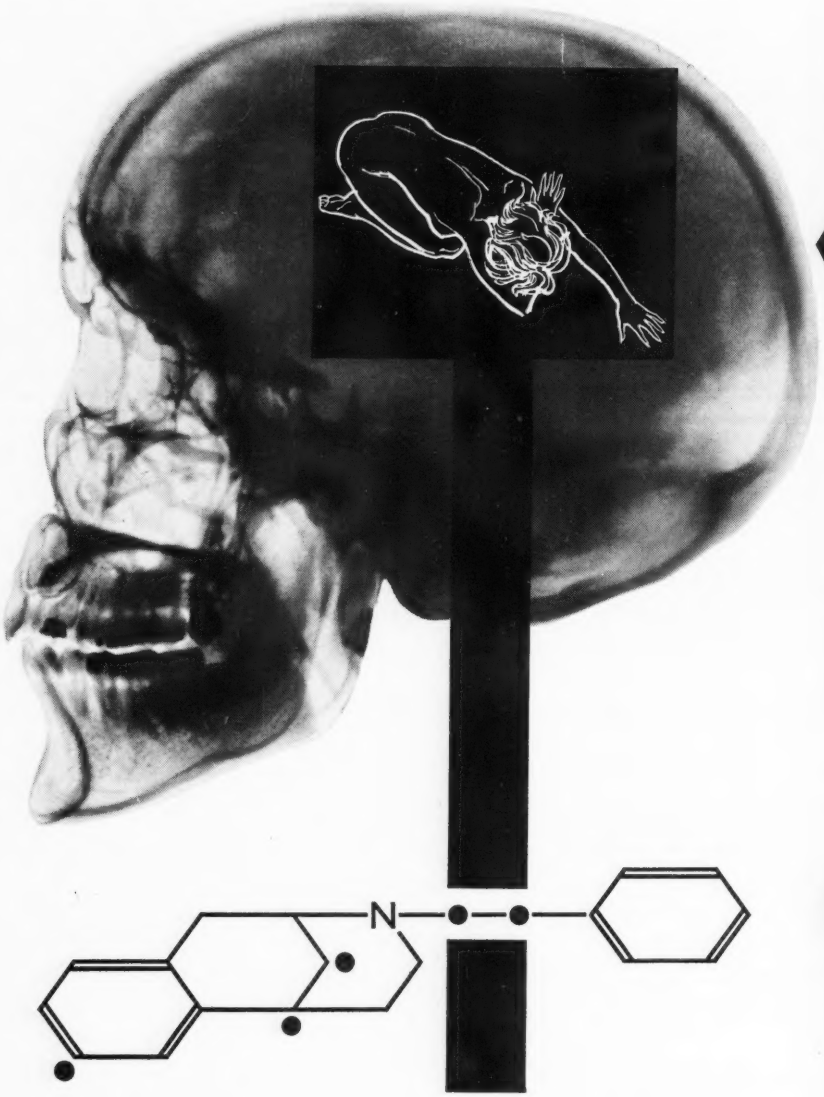

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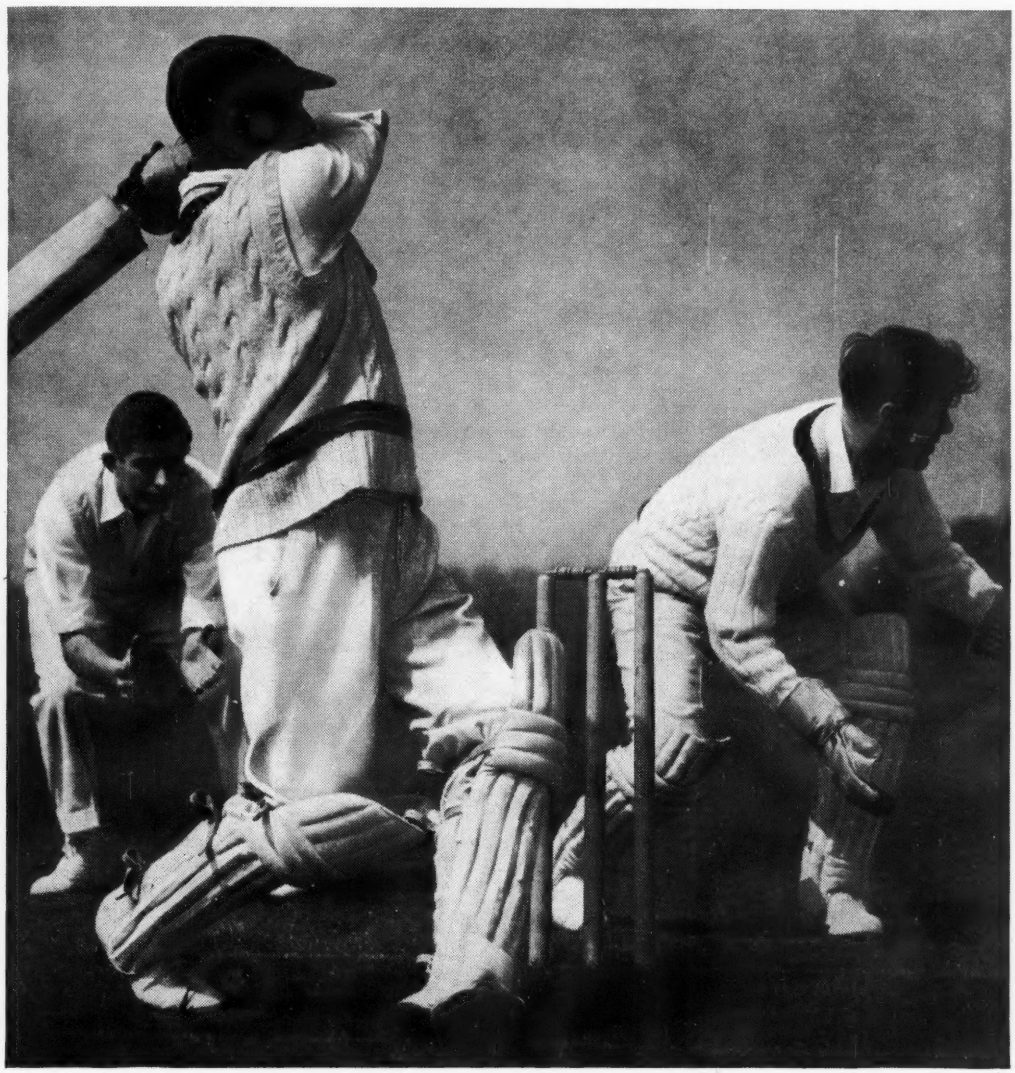

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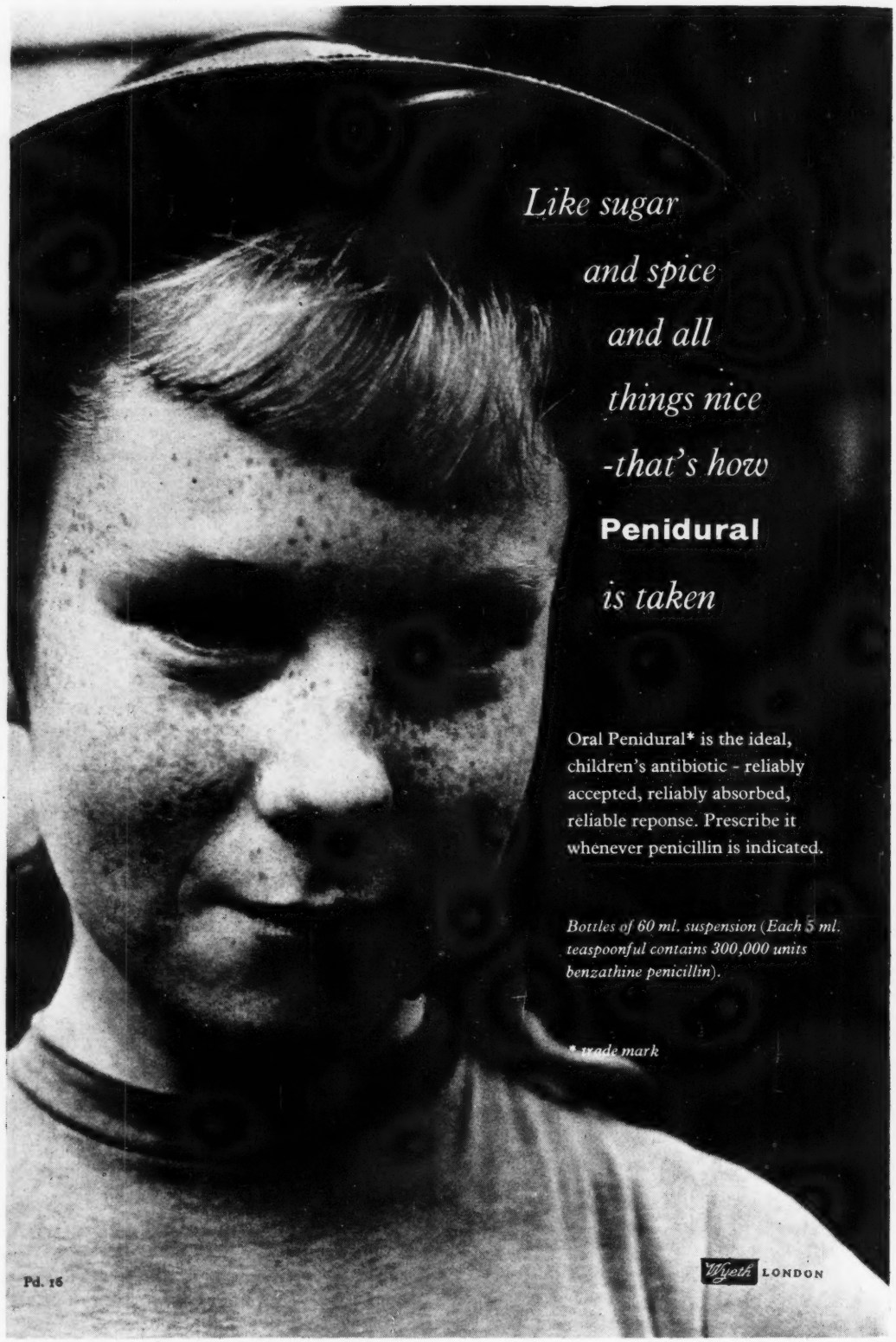
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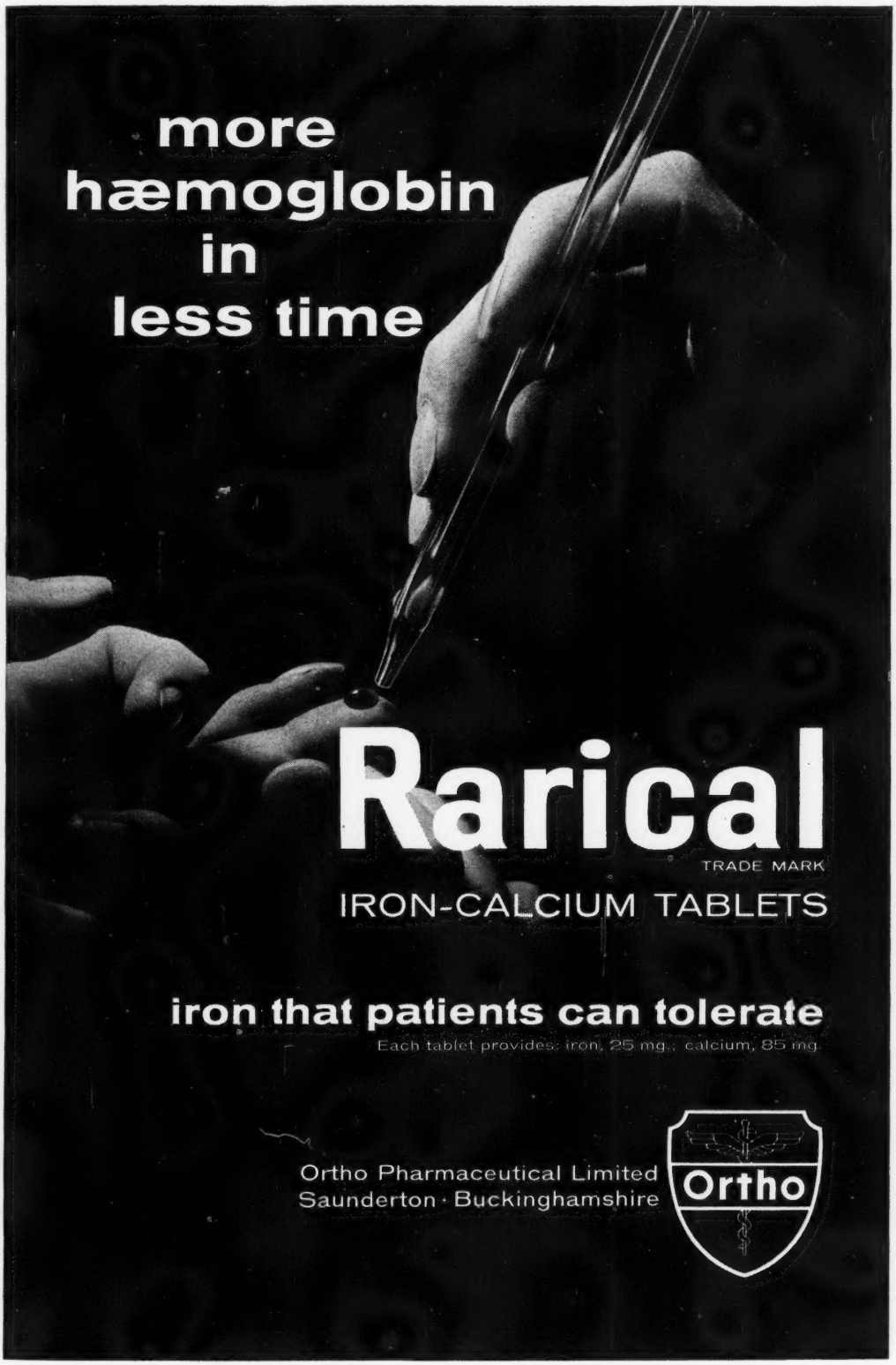
Bottles of 60 ml. suspension (Each 5 ml. teaspoonful contains 300,000 units benzathine penicillin).
* trade mark
Pd. 16
Wyeth LONDON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hæmoglobin
in
less time
Rarical
TRADE MARK
IRON-CALCIUM TABLETS
iron that patients can tolerate
Each tablet provides: iron, 25 mg.; calcium, 85 mg.
Ortho Pharmaceutical Limited
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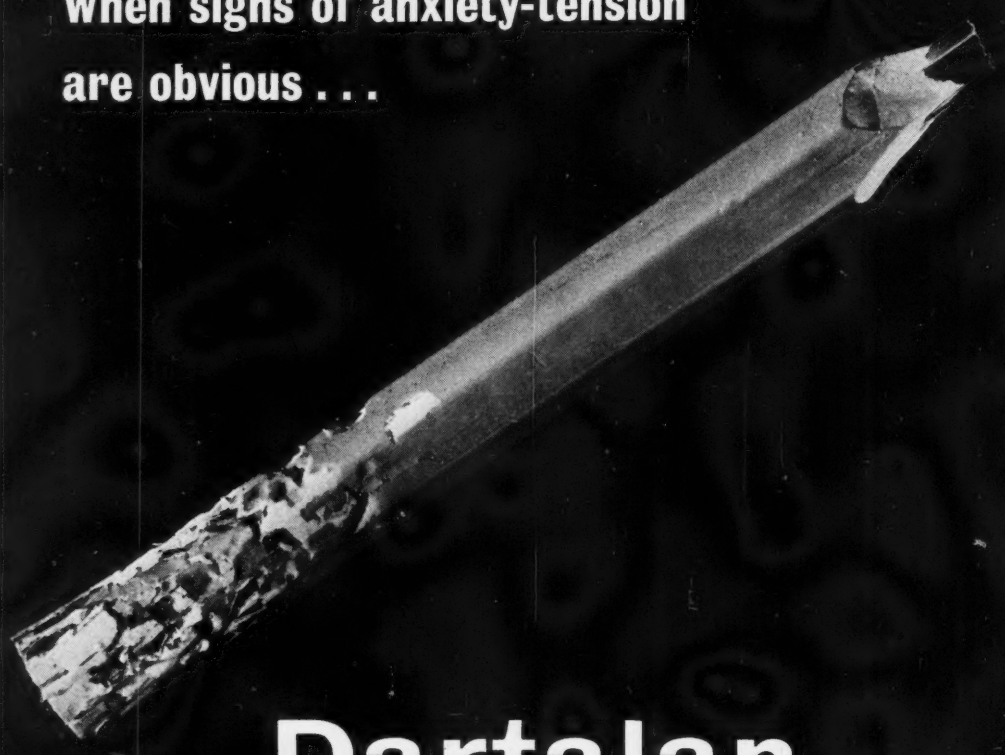
When signs of anxiety-tension are obvious . . .



# Dartalan

Brand of Thiopropazate dihydrochloride

## safe and effective in

**PSYCHOSES** Particularly Schizophrenia

**NEUROSES** Tension states and patients with obsessional traits

**GERIATRICS** Agitated states in the elderly

**GENERAL MEDICINE** Pain in inoperable carcinoma and control of nausea and vomiting

SEARLE

The Imperial Standards of Length are to be found at Trafalgar Square, London, and in the City's ancient Guildhall. Measurements of length have been related to these standards since they were laid down in 1876.

To-day, in the diuretic field, 'SALURIC' is accepted as the standard – for 'SALURIC' has brought a new degree of efficacy, safety and convenience to diuretic therapy.

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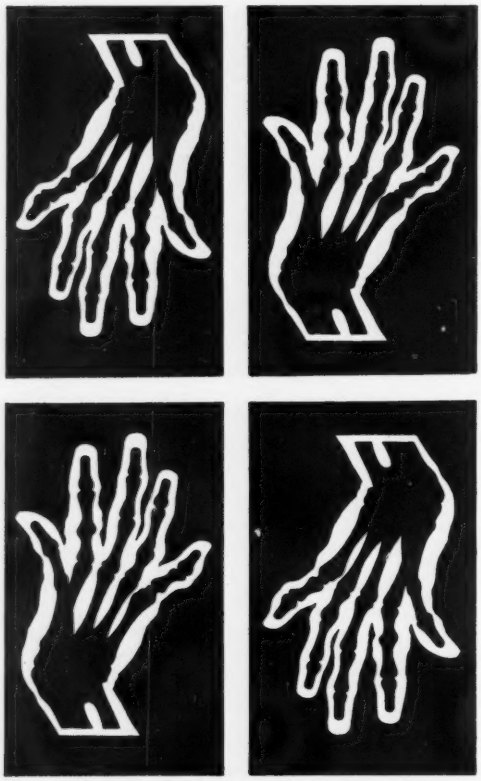
(CHLOROTHIAZIDE, 0.5 G. TABLETS)

***More patients are maintained on 'SALURIC' than on all other diuretics together***

*The United Kingdom N.H.S. basic cost of 12 tablets is 4s. 6½d.*
*Trademarks outside the United Kingdom: 'Chlotride', 'Clotride', 'Diuril'.*

*Made in England by* **MERCK SHARP & DOHME LIMITED, HODDESDON, HERTS**



'We can only hope
that the next 10 years will
see the discovery
of a specific cure for this
increasingly prevalent disease.'

*Brit. med. J.*, (1959) **2**, 1391

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Now established
radical treatment for

# Rheumatoid Arthritis

# RESOCHIN

chloroquine phosphate

# 1 Tablet daily

Good to excellent results in
70% of patients
total remission in 35% of patients

Resochin (chloroquine phosphate)
has important, new implications in
the treatment of rheumatoid arthritis.
Extensive clinical trials
have shown that good to excellent
results are obtained in 70% of
patients treated.
**In more than half of
these patients total remission of
the disease was achieved.**[1]

Each Resochin tablet contains
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Available in containers of 100 tablets.

1. 'The value of chloroquine in
Rheumatoid Disease:
A four-year study of continuous therapy.'
*Canad. med. Ass. J.*, **77**, 182. (1957).

**Farbenfabriken Bayer AG. Leverkusen**
*Sole distributors in the United Kingdom*
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'Resochin' is a trade mark FBA17

*For the first time –*

**A SINGLE-DOSE treatment for THREADWORMS***

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"With its high cure-rate, lack of toxicity, ease of administration, and simplicity of dosage, we regard pripsen as, at present, the remedy of choice for enterobiasis."

*Lancet*, 1960, 1, 256

* *A single dose is also effective in the treatment of roundworms.*

*PACKINGS*
160 gr. (10.4 grammes)
— one full dose
1 lb. (454 grammes)
— 43 full doses
*Available only on prescription.*

**Pripsen**
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GRANULES
PIPERAZINE PHOSPHATE WITH STANDARDIZED SENNA

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*to relieve anxiety and tension . . .*

*to calm the psychoneurotic . . .*

*to control the acute psychotic . . .*

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PERPHENAZINE

*the broad-span phenothiazine*

*and unsurpassed anti-emetic*

FENTAZIN (perphenazine) is remarkably effective in a wide range of psychiatric disorders. Virtually free from side-effects, it is eminently suitable for the routine management of minor anxiety and tension states.

FENTAZIN is several times more active than older phenothiazines, and offers rapid control of even acute psychoses.

In addition, FENTAZIN is unsurpassed as an anti-emetic.

FENTAZIN TABLETS contain 2mg., 4mg., or 8mg. perphenazine. Supplied in bottles of 50 and 500 tablets of each strength.

FENTAZIN INJECTION contains 5mg. perphenazine in each 1 c.c. Supplied in ampoules of 1 c.c. in boxes of 5 ampoules.

*'FENTAZIN' is a trade mark*

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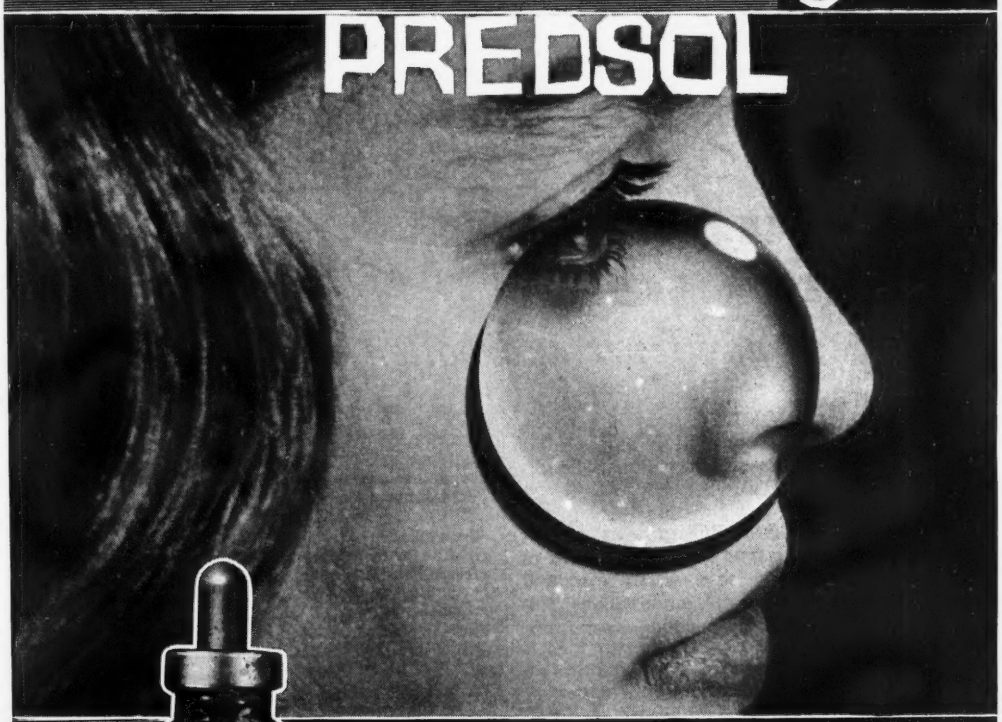
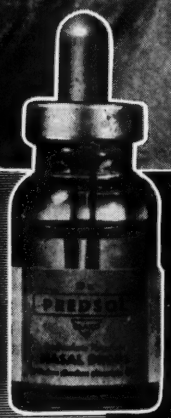
AH85

# For hay fever ... clearly PREDSOL






Predsol* Nasal Drops contain
no insoluble hormone particles
Predsol is water-soluble prednisolone phosphate

*Glaxo trade mark

GLAXO LABORATORIES LTD.
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Subsidiary Companies or Agents in most countries

# running noses

## *in hay fever and pollen allergies*

'TRIOMINIC' stops rhinorrhoea, nasal congestion and similar disturbances in seasonal allergies —*orally*.

'TRIOMINIC' provides prompt and lasting symptomatic relief of running nose, watery eyes and sneezing, by antihistamine *plus* decongestant action—*systemically*.

'TRIOMINIC' *timed release* tablets each act for 6 to 8 hours.

**Each Tablet:**
Phenylpropanolamine hydrochloride (norephedrine hydrochloride) 50 mg.
Mepyramine maleate B.P. 25 mg.
Pheniramine maleate 25 mg.

*S.7 Part I*

**Also available:** 'Triominic' Syrup for children and for adults requiring greater flexibility of dosage. Each teaspoonful is equivalent to ½ 'Triominic' Tablet.

**Packs:** Tablets, bottles of 50 and 250 (dispensing); Syrup, bottles of 2 fl. oz. and 20 fl. oz. (dispensing).

**Basic N.H.S. Prices:**
12 Tablets (average script), 2/1d. plus P.T.; 2 fl. oz. Syrup, 2/6d. plus P.T.

**Triominic**
WANDER

M412

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## tablets

Each tablet contains 0·05 g. of 1-piperidino-2-methyl-3-p-tolyl-propanon-3-hydrochloride

Diminishes the pathologically enhanced muscle tone of extrapyramidal origin

In multiple sclerosis, paraplegia, flexor contracture, muscular spasms, contracture of limbs, etc.

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**If the oral diuretic you prescribe is to be CONSISTENTLY successful, it must satisfy six main criteria:**

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6. Must show no significant degree of side-effects or toxicity

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**'DIREMA'**

*is issued in tablets of 25 mg. and 50 mg. Both strengths are available in tubes of 25 and bottles of 100 and 500. Basic cost to N.H.S. of 12 tablets from dispensing pack of 100—2s. 7d. or 4s. 8½d. according to strength.*

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# 'DIREMA'

## is today's successful diuretic

'DIREMA'—the DC(B)L brand of hydrochlorothiazide—

measures up closely to *all* those criteria.

Among the established indications for this most potent oral

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# Dosulfin®

(Tablets of 0.75 G containing equal parts of Sulphaproxyline and Sulphamerazine).

## 3 times a day control of Upper Respiratory Tract infections by Dosulfin

Therapeutically effective Dosulfin blood levels achieved within 2 hours of initial administration.

Adult Dosage

| No. of tablets | Morning | Mid-day | Evening |
|---|---|---|---|
| First day | 2 | 1 | 1 |
| Second day | 1 | 1 | 1 |
| Third day | 1 | 1 | 1 |
| From fourth day | 1 | — | 1 |

Geigy Pharmaceutical Company Ltd.,
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PH 161

NOW EXEMPT FROM P.T.

**a new major tranquilliser . . .**

"Melleril was superior to all other phenothiazines in its ability to bring about clinical improvement in florid and overactive schizophrenics with the minimum of side-effects . . ."
*J. ment. Sci.* (1960) **106,** 732.

"The most striking aspect of Melleril therapy is the poverty of side-effects."
*J. Amer. med. Ass.* (1959) **170,** 1283.

**Melleril**
BY **SANDOZ**

the tranquilliser pure and simple

Thioridazine hydrochloride 10 mg. 25 mg. 50 mg. 100 mg.
Bottles of 50 and 250 tablets

*Holy Trinity, Stratford-upon-Avon*

**. . . in mental and emotional disturbance**

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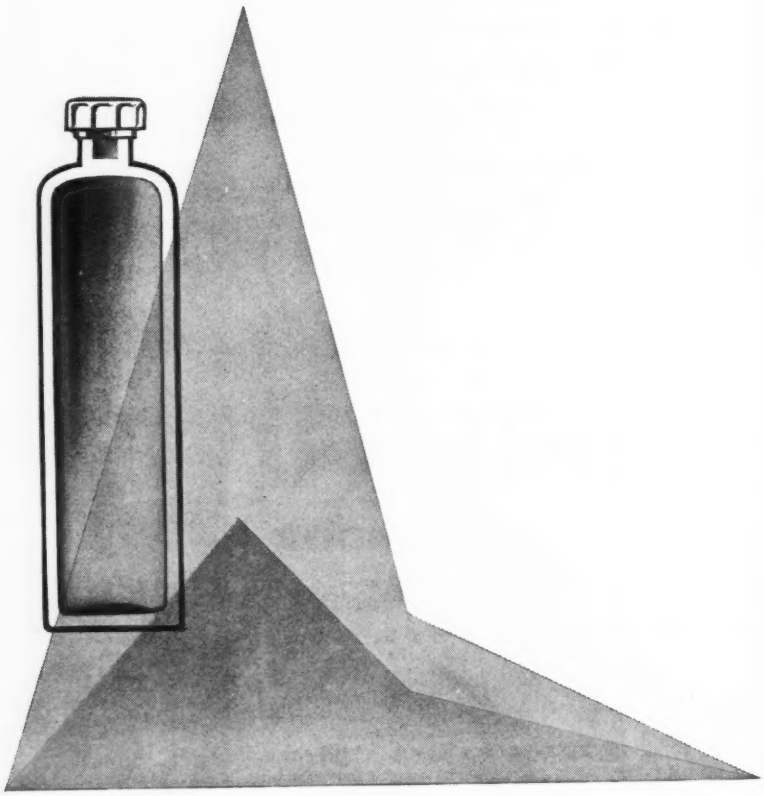
## can now be given as SYRUP*



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**Broxil (BRL 152) is the potassium salt of 6-(α-phenoxypropionamido) penicillanic acid**

*Supplied as a powder for preparation of 60 cc. aqueous solution containing 125 mg. Broxil per 5 cc. teaspoonful.*

N.H.S. Price . . . 12/4

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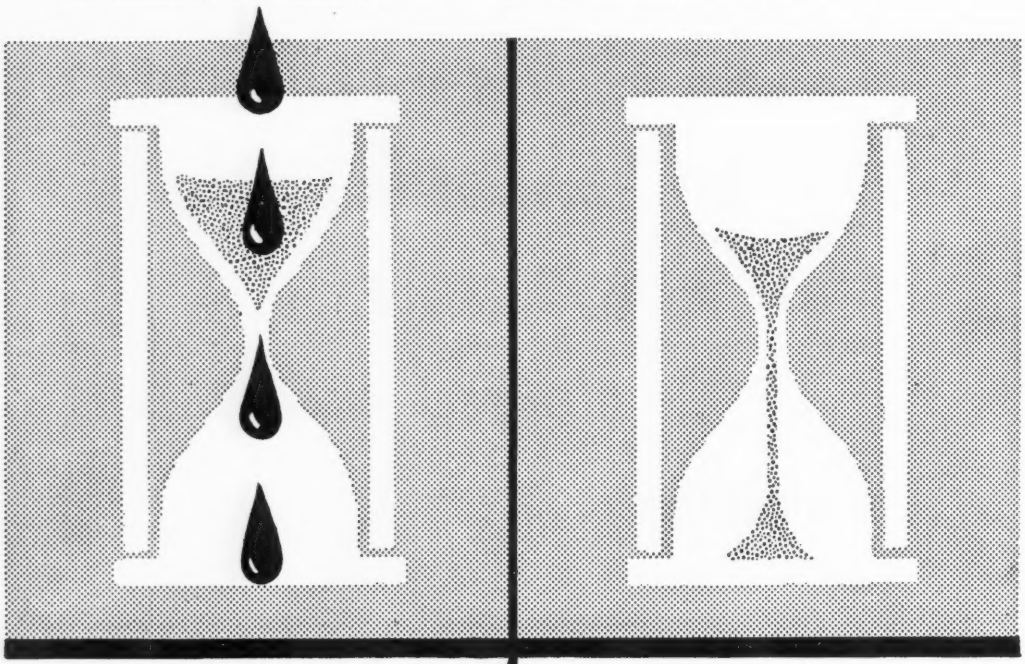
Adrenoxyl is a capillary haemostatic which reduces the mean capillary bleeding time by increasing the contractility and resistance, and decreasing the permeability of the capillary wall.



### Reduces capillary oozing

Reports have been received of the value of Adrenoxyl in diminishing capillary oozing both at the time of operation and post-operatively in many types of operation, including ear, nose and throat, ophthalmic, plastic and dental surgery. It has no effect on venous or arterial bleeding.

### Safe and free from side-effects

Adrenoxyl is safe, and no side-effects have been reported following its use. It does not affect pulse rate, blood pressure, nor blood coagulation.

### Packs

Adrenoxyl is available in ampoules for intramuscular or subcutaneous injection and in tablets for oral administration.

AMPOULES Each 2 ml. ampoule contains 0.75 mg. of adrenochrome monosemicarbazone dihydrate. The ampoules are packed in boxes of 6 and 50.

TABLETS Each tablet contains 2.5 mg. of adrenochrome monosemicarbazone dihydrate. The tablets are packed in tubes of 25 and bottles of 500.

### References

Anaesthesia, adrenoxyl ad perfusionem and the reduction of blood loss. *Anaesthesia*, 1958, **13**, 56
(*The adrenoxyl ad perfusionem was specially prepared in a strength and solution suitable for administration by intravenous drip.*)
Anaesthesia for Fractures of the Femoral neck. *Lancet* 1957, **1**, 1092
Principles of Surgical Technique. *Brit. Med. J.*, 1956, **1**, 925

*Fuller information available from*
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# In dermatoses

## *'response . . . significantly superior'*

## with triamcinolone

A clinical comparison of triamcinolone 0.1% with hydrocortisone 1.0% and other steroids produced striking confirmation of the superiority of triamcinolone in topical applications. Results in 58 cases of various dermatoses showed that triamcinolone was more successful than hydrocortisone in 40 cases and equally successful in a further 14. Hydrocortisone was more effective in only one case. Similar results were achieved when triamcinolone was compared with the other steroids.[1]

[1] *Antibiot. Med. 6; 734. 1959.*

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TRIAMCINOLONE

*REGD. TRADEMARK

Such clinical results amply justify the ever-increasing use of LEDERCORT triamcinolone Cream and Ointment in the treatment of skin diseases. LEDERCORT is often dramatically active, it is safe, does not cause sodium or water retention, and is effective on sparing application. In anti-inflammatory, anti-pruritic and anti-allergic topical corticosteroid therapy, LEDERCORT is unsurpassed.

**CREAM 0.1% OINTMENT 0.1%**

**PACKING AND BASIC N.H.S. PRICE:**

*Tubes of 5 Gm. . . . . 4/2d.*
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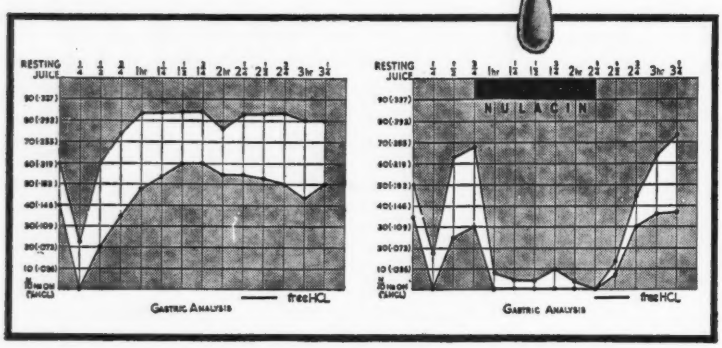
# NULACIN "has revolutionized the treatment of duodenal ulcer"

*"This new method of the administration of antacids (Nulacin) has revolutionized the treatment of duodenal ulcer . . . milk drip is no longer part of our therapeutic stock in trade."*

PROC. ROY. SOC. MED., *December, 1958*, **51**, 1063

NULACIN tablets, when allowed to dissolve slowly in the mouth, provide intragastric milk-alkali drip therapy safely and effectively for both the bedridden and ambulant patient. They may be relied on to provide a treatment for peptic ulcer as well as other conditions associated with gastric hyperacidity.




The safety and effectiveness of Nulacin* therapy has been proven by "in vivo" clinical work carried out in many countries. References to this work include :—

Current Status of the Medical Treatment of Peptic Ulcer, *Med. Times*, January, 1958, **1**, 74

Antacids, *The Practitioner*, January, 1957, **178**, 43

Antacids in Peptic Ulcer, *The Practitioner*, January, 1956, **176**, 103

Recent Advances in the Ulcerative Diseases of the Gastrointestinal Tract, *Amer. J. Gastro.*, December, 1956, **26**, 665

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Control of Gastric Acidity by a New Way of Antacid Administration, *J. Lab. & Clin. Med.*, 1953, **42**, 955

The Effect on Gastric Acidity of "Nulacin" Tablets. *Med. J. Aust.*, 28th November, 1953, **2**, 823-824

**Nulacin tablets have no B.P. equivalent. The basic N.H.S. price of the 25 tablet tube is 2/-.**

*A Nulacin tablet of 48 grs. contains Magnesium Trisilicate B.P. 3·5 grs., Heavy Magnesium Oxide B.P. 2·0 grs., Calcium Carbonate B.P. 2·0 grs., Heavy Magnesium Carbonate B.P. 0·5 gr., Ol. Menth. Pip. B.P. q.s.

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PIRITON... and this is why-

**PIRITON**

- ✻ relieves symptoms within ten to thirty minutes
- ✻ provides sustained relief
- ✻ is unexcelled in safety and tolerance
- ✻ is virtually free from side-effects—reports of dizziness and drowsiness are rare

*for relief lasting 4 to 6 hours*

**PIRITON Tablets**

*Each tablet contains 4 mg. Piriton (chlorpheniramine maleate B.P.C.)*

BOTTLES OF 25 AND 500 TABLETS

* * *

*for rapid and sustained relief lasting up to 12 hours*

**PIRITON Duolets**

*Each contains 8 mg. Piriton; 4 mg. for immediate action and 4 mg. in inner core for delayed action.*

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✻ is suitable for administration to children

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ORAL IRON THERAPY WHICH IS SAFE AND EFFECTIVE

'Ferroids' tablets contain 350 mg. iron aminoates, a partly chelated complex of iron and amino acids which
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**DOSAGE** One tablet three times daily is usually sufficient. Up to eight tablets daily—and more—are well-tolerated even if taken *between* meals, the time for maximum absorption of ingested iron.
**PACKS** In containers of 100 and 1000 tablets.

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* J. Obstet. Gynaec. Brit. Emp., (1959) 66:627.

RIKER 'Ferroids' is a registered trade mark

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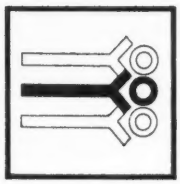
# SQUARE PEG



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## selective in hypertension

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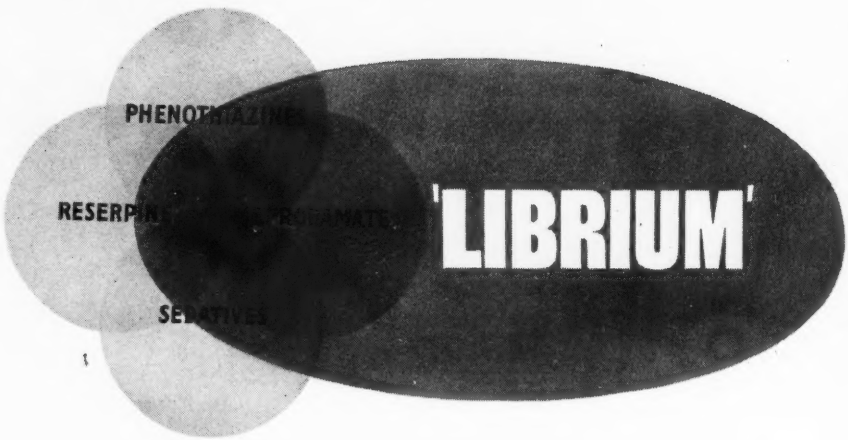
TRADE MARK BRAND

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dermatoses

for large areas

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Applies the full potency right on to the skin: does not sting, burn or irritate. Isn't tacky. Easy and convenient to use. Handling of tender fragile skin is avoided.

**presentation:** Plastic-coated bottles containing 100 mg. Cortril (hydrocortisone).

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**superior topical ointment**

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**presentation:** Non-greasy ointment 0·5%, 1·0% & 2·5%. Greasy ointment 1·0% & 2·5%.

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**with**

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*trade mark* *brand*

TRIMEPRAZINE TARTRATE

for **oral** use in the relief of pruritus

TABLETS of 10 mg. and SYRUP containing 2 mg. trimeprazine tartrate per ml.

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New

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## make ORAL IRON THERAPY pleasant and SAFE

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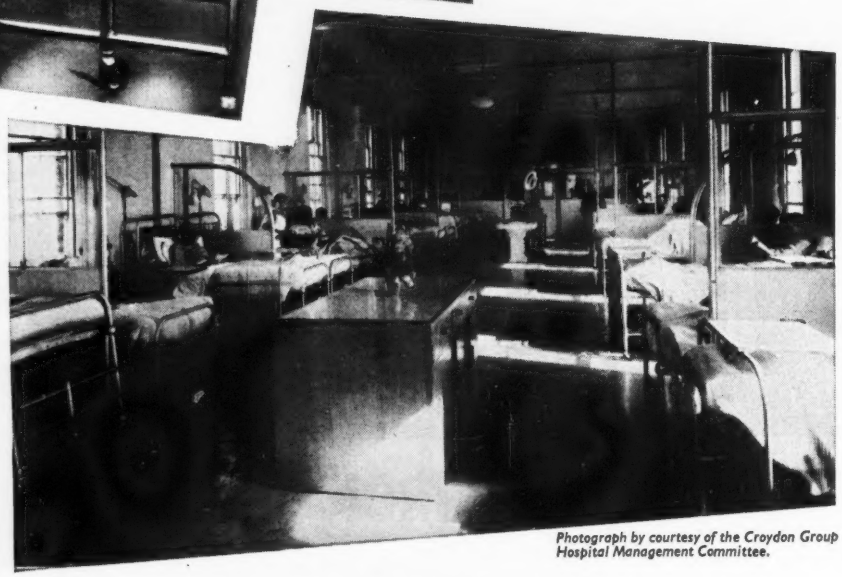

*A WARD IN THE MAYDAY HOSPITAL USING AYGEE MODERNISED BEDS*

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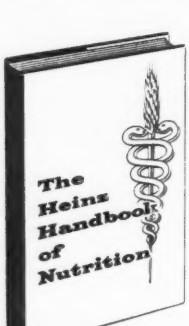


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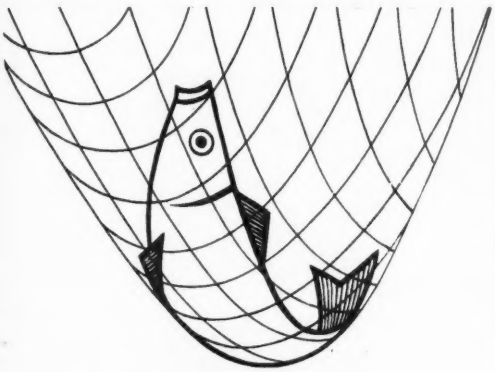

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*The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.*

## Academic and Educational

### THE MILROY LECTURES ON STATE MEDICINE AND PUBLIC HEALTH

The Council of the Royal College of Physicians of London are prepared to receive applications for the office of MILROY LECTURER for 1962.

Applications must be addressed to the Registrar, Royal College of Physicians, Pall Mall East, S.W.1, to reach the College on or before Wednesday, 7th September, 1960, and to include a short synopsis of the subject selected by the candidate.

2 Lectures are to be given on a TUESDAY and THURSDAY in FEBRUARY or MARCH, 1962.

A copy of Dr. Milroy's "Suggestions" on the subject of his bequest, and information as to the emolument, may be obtained from the Registrar.

### UNIVERSITY OF LONDON

(BRITISH POSTGRADUATE MEDICAL FEDERATION)

INSTITUTE OF NEUROLOGY

(Queen-square)

2 COURSES of Clinical Demonstrations open to Postgraduates will be held at The National Hospital, Queen-square, on WEDNESDAYS at 4.15 P.M. from 6TH JULY to 21ST SEPTEMBER, 1960 inclusive, and on SATURDAYS at 10.30 A.M. from 9TH JULY to 24TH SEPTEMBER, 1960, inclusive.

The fee for attending either of these courses is 2 guineas.

Application for a ticket should be made to the Dean, Institute of Neurology, The National Hospital, Queen-square, W.C.1, and a remittance to cover the fee enclosed. Only postal applications will be considered.

### THE UNIVERSITY OF LIVERPOOL

DEPARTMENT OF ANÆSTHESIA IN ASSOCIATION WITH THE ROYAL LIVERPOOL CHILDREN'S HOSPITAL AND ALDER HEY CHILDREN'S HOSPITAL

A COURSE in Pædiatric Anæsthesia for Consultants and Senior Registrars will be held from 7TH to 12TH NOVEMBER inclusive. There will be lectures and discussion each day and demonstrations will be given of all aspects of pædiatric anæsthesia including that for cardiological investigation and surgery. In addition to the staff of the Department and hospital, Dr. ROBERT SMITH of Boston, U.S.A., and Dr. ROBERT COPE of London, will be visiting lecturers.

The number taking the Course will be limited to 14 and the closing date for applications will be 20th July. The fee will be £12 12s.

Applications stating qualifications and present appointments should be sent to the Professor of Anæsthesia, 48, Bedford-street North, Liverpool, 7, and quoting reference number CV/L.

### THE ROYAL SOCIETY

GOVERNMENT GRANT FOR SCIENTIFIC INVESTIGATIONS

Applications for grants from the second allotment of the Government Grant for Scientific Investigations for the year 1960 should be made as soon as possible on forms of application to be obtained from the Assistant Secretary of the Royal Society, Burlington House, London, W.1. No application can be considered which is received later than 31st July, 1960.

Applicants must be of British nationality, resident in Great Britain or Northern Ireland. Grants may be made for purposes in connection with the promotion and support of research in pure science other than for personal maintenance or payment of stipends; for the assistance of scientific expeditions and collections; but not in aid of scientific publications.

### GEORGE HENRY LEWES STUDENTSHIP

Applications are invited for the above Studentship which will be vacant on 1ST OCTOBER, 1960. The Student is required to give his whole time to research work except such as, in the opinion of the Trustees, does not interfere with his original inquiries.

Candidates should send (*a*) a statement of their qualifications, and their need of pecuniary help, (*b*) the subject of their proposed research, (*c*) the name of 1 referee, to Professor Sir BRYAN MATTHEWS, Physiological Laboratory, Cambridge, by 9th July, 1960. The Student is expected normally to work in the Physiological Laboratory, Cambridge, though in exceptional conditions he may obtain permission to work elsewhere. Emolument depends on qualifications, up to a maximum of £750 p.a.

### LOUGHBOROUGH COLLEGE OF TECHNOLOGY

RESEARCH FELLOWSHIPS AND SCHOLARSHIPS

The Governors propose to make the following awards for the Academic Year 1960/61.

*Research Fellowships*, of annual value £750, tenable for a period of up to 3 years with a possibility of further extension. Applications are invited from persons, of either sex, who hold a degree, or equivalent qualification, have obtained some industrial or research experience, and are eager to carry out research, under the general supervision of an experienced research-worker, in one of the fields of engineering, applied science, human sciences, and natural sciences. Fellows may be invited to undertake a limited amount of occasional tutorial work or laboratory supervision for which they receive additional payment.

*Research Scholarships*, of annual value £350–£500, according to age and circumstances, for a period of 3 years. Applications are invited from holders (of either sex) of a degree, or equivalent qualification, who wish to obtain research training while carrying out research work, in one of the above-mentioned fields, in association with an experienced research-worker, that may lead to a higher academic award. Scholars may be invited to undertake a limited amount of tutorial work and laboratory supervision.

Fellows and Scholars may reside in a Hall of Residence.

Applications should be made to the Academic Registrar, quoting reference 9/AR.

### UNIVERSITY OF ABERDEEN

GEORGINA MCROBERT RESEARCH FELLOWSHIP

A Senior Research Fellow is required to collaborate in the immunopathological research programme being carried out in the Departments of Pathology, Bacteriology and Biological Chemistry. The Fellow, who should have histological training and preferably some experience in immunological methods, would work in the Department of Pathology. The work will include immunohistochemical studies with fluorescent antibody but previous experience of this technique is not necessary. Salary within the range £1000–£1500 according to qualifications and experience. Superannuation (F.S.S.U.) and child allowance.

Particulars from the Secretary, The University, Aberdeen, with whom applications (8 copies containing the names of 2 referees) should be lodged by 14th July, 1960.

### MENTAL HEALTH RESEARCH FUND

STUDENT PRIZES AND TRAVELLING FELLOWSHIP IN PSYCHIATRY

The Mental Health Research Fund awards annually to Medical Students and Doctors in their pre-registration year 3 Monetary Prizes and a Travelling Fellowship as the result of an essay competition on a subject relating to mental health, and a subsequent interview.

Applicants gaining the top 3 places in the essay competition will be given prizes of £100, £50, and £25 respectively.

The Travelling Fellowship, tenable in a Psychiatric or other Department abroad for up to 6 months, will be awarded as the result of an interview combined with consideration of the candidate's undergraduate record. Persons interviewed will be chosen from the top 10 in the essay competition. The travelling fellowship will normally be taken up at the end of the pre-registration year or, in the event of it being awarded to a medical student, may be taken up after qualification.

The subject for the essay this year is "Discuss the Present Status of Biochemical Research in Schizophrenia".

The Panel of Examiners consists of 2 members of the Research Committee of the Mental Health Research Fund and 1 member of the Association of Teachers of Psychiatry in Undergraduate Medical Schools.

Essays should be sent, before 1st March, 1961, to the Secretary, Research Committee, Mental Health Research Fund, 39, Queen Anne-street, London, W.1 (telephone WELbeck 1272), from whom further details may be obtained.

### TRAVELLING FELLOWSHIP

Applications are invited from registered medical practitioners for a Travelling Fellowship. The Fellowship aims to provide 1 year of postgraduate study in medicine or allied subjects at centres abroad. The basic allowance will be at the rate of £750 p.a. an additional allowance being made for travelling and according to the country visited. Candidates should supply full details of the intended study, including the name of the department or centre at which they intend to work, with assurance of consent from the head of the department concerned. Applicants must be permanently resident in the sterling area.

Applications should be marked "Travelling Fellowship" and should be made, giving the names of 2 referees, to A. G. TROWER, The Dowager Countess Eleanor Peel Medical Research Trust, 5, New-square, Lincoln's Inn, London, W.C.2.

### WORLD HEALTH ORGANIZATION

FELLOWSHIPS

A small number of Fellowships for study abroad will be awarded in 1961 by the World Health Organization to registered medical practitioners, dental practitioners, state registered nurses or other professional personnel engaged in the health services, medical education or medical research in the U.K. The Fellowships will normally be of a few months' duration.

Applicants should be of at least 5 years' standing in their profession and of sufficient experience in their field of study to be able to assess critically the value of experience abroad and to utilise it for the benefit of the health services of the U.K. They will be expected to continue in the health services of the U.K. for at least 3 years after holding a Fellowship.

Applications, giving full particulars of qualifications, experience, proposed programme and duration of study, and accompanied by the names of 2 referees, should be sent :—

(*a*) By those resident in Scotland to the Secretary, Department of Health for Scotland, St. Andrew's House, Edinburgh, 1;

(*b*) By those resident in Northern Ireland to the Secretary, Ministry of Health and Local Government, Stormont, Belfast; and

(*c*) By others to the Secretary, Ministry of Health, Savile-row, London, W.1.

Envelopes should be marked "World Health Organization Fellowships". Applications must be received on or before 15th July, 1960.

### SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 11TH JULY, 1960. The following Examination will be held in DECEMBER, 1960.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

### ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.

Applications are invited for a HILL PATTISON-STRUTHERS BURSARY of £100 which will be awarded to a graduate attending the Internal Medicine Course (beginning in SEPTEMBER, 1960) organised by the Edinburgh Post-Graduate Board for Medicine. In making the award, consideration is given to the need to maintain the international character of the Edinburgh Medical School.

Applications, giving details of age, qualifications, experience, and possible financial hardship involved in attending the Course, together with the names of 2 referees (not necessarily medical), should be submitted to the Secretary, Royal College of Physicians, 9, Queen-street, Edinburgh, 2, not later than 23rd July, 1960.

**INSTITUTE OF UROLOGY in association with ST.** PETER'S, ST. PAUL'S and ST. PHILIP'S HOSPITALS. Full-time RESIDENT MEDICAL REGISTRAR for work in Medical Unit (Metabolic) at St. Philip's Hospital. Beds under the care of a Consultant, also occasionally at St. Peter's and St. Paul's Hospitals. Scope for research and work with artificial kidney and renal biopsy. Would be expected to undertake routine work while Surgical Registrar is off duty. Salary at the rate of £972 8s. for first year, less £170 for board.

Applications to the Secretary, Institute of Urology, 10, Henrietta-street, London, W.C.2.

**THE MEDICAL COLLEGE OF ST. BARTHOLOMEW'S** HOSPITAL, West Smithfield, E.C.1. Applications are invited for the post of JUNIOR LECTURER IN PHYSIOLOGY tenable as from 1st October, 1960. Candidates should have a medical degree and preferably a degree in physiology. The salary is on the scale £850–£50–£1050 (under review) plus £60 London allowance and children's allowance.

Forms of application, which must be returned not later than 11th July, may be obtained from the Secretary of the Medical College.

**THE UNIVERSITY OF MANCHESTER. Applications** are invited for the post of Temporary LECTURER in Medical Physics in the Department of Medicine. The appointment will be made for a period of 1 year from 1st September, 1960. The salary will be on a scale £1050–£1850 p.a. according to qualifications and experience. Membership of children's allowance scheme.

Applications should be sent not later than 11th July, 1960, to the Registrar, The University, Manchester, 13, from whom further particulars and forms of application may be obtained.

**THE UNIVERSITY OF MANCHESTER. Applications are** invited from registered medical practitioners for the Full-time post of LECTURER IN MEDICINE. Preference will be given to candidates who are interested in the investigation of respiratory diseases. The Board of Governors of the United Manchester Hospitals may be prepared to negotiate an honorary contract as Consultant with the person appointed. Duties to commence 1st October, 1960, or as soon as possible thereafter. Salary on a scale rising to £2150 p.a., initial salary according to qualifications and experience. Membership of the F.S.S.U. and children's allowance scheme in force.

Applications should be sent not later than 11th July, 1960, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

**UNIVERSITY OF EDINBURGH. Applications are** invited from medical or dental graduates for the post of LECTURER IN DENTAL BACTERIOLOGY. Salary scale (under review) £900–£100–£1300 ; Bar : £1400–£100–£1900 p.a., with placement according to qualifications and experience, and with superannuation benefit and family allowance where applicable. Applicants for the post should have had some experience in microbiology and in research methods. The duties of the successful applicant would be concerned with undergraduate teaching and with diagnostic and research work.

Further particulars may be obtained from the undersigned, with whom applications (6 copies), giving the names of 2 referees, should be lodged not later than 30th July, 1960.

CHARLES H. STEWART, Secretary to the University.

**UNIVERSITY OF GLASGOW. Department of Medicine,** GARDINER INSTITUTE, THE WESTERN INFIRMARY. Applications are invited for a LECTURESHIP IN MEDICINE in the above Department. Salary according to placement on University scale for clinical teachers. The final maximum at present is £1900 p.a. F.S.S.U. and family allowance benefits.

Applications (12 copies) should be lodged, not later than 20th July, 1960, with the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

**THE ROYAL NORTH SHORE HOSPITAL OF SYDNEY**

BRITISH AUSTRALASIAN TOBACCO COMPANY
FELLOW IN CANCER RESEARCH

The above vacancy exists in the Unit of Clinical Investigation. The duties of the successful applicant would be to study factors related to the growth and metastasis of cancer cells. He could begin with interesting work already established in the Unit and develop his own lines of research. Appointment would be for 1 year but would be renewable for 3 years or more depending on the progress of the work. Applicants should be either medical or science graduates, preferably with some training in biological laboratory work. Salary up to £3250 p.a., depending on qualifications and experience.

Letters of application and inquiries should be addressed to the General Medical Superintendent, The Royal North Shore Hospital of Sydney, Crows Nest, N.S.W., Australia. Closing date 13th July.

**UNIVERSITY OF CAPE TOWN/PROVINCIAL AD-**MINISTRATION OF THE CAPE OF GOOD HOPE. Joint Medical Staff. Applications are invited for the post of LECTURER IN PHARMACOLOGY. Candidates should have either a medical degree or a degree in pharmacology or pharmacy. The appointment will be made under the terms of the Joint Staff Agreement between the University of Cape Town and the Provincial Administration of the Cape of Good Hope. The salary for the post is £1740 p.a. (grade C).

Applicants should state age, qualifications, experience, publications, and research interests, and give the names of 2 referees whom the University may consult. 2 copies of the application should be sent to the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1 (from whom a memorandum giving the information concerning the Department should be obtained), not later than 15th July, 1960. A third copy should be sent direct by airmail to the Registrar, University of Cape Town, Private Bag, Rondebosch, Cape Town, South Africa, to reach him by the same date.

The University reserves the right to recommend the appointment of a person other than one of the applicants or to recommend no appointment.

## Hospital Services: Senior Appointments

**ROYAL FREE HOSPITAL GROUP. Applications are** invited from Women medical practitioners for the appointment of Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, to work at the Elizabeth Garrett Anderson Hospital, Euston-road, N.W.1, for 4 sessions per week. Duties to commence 1st November, 1960. Applicants must be Members of the Royal College of Obstetricians and Gynæcologists.

Applications, stating details of age, qualifications and experience, together with the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 29th July, 1960.

**ROYAL FREE HOSPITAL GROUP. Applications are** invited from Women medical practitioners for the appointment of Part-time CONSULTANT GENERAL PHYSICIAN at the Elizabeth Garrett Anderson Hospital, Euston-road, N.W.1, for 3 sessions per week. Duties to commence 1st November, 1960. Applicants must be Members of the Royal College of Physicians (London).

Applications, stating details of age, qualifications and experience, together with the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, London, W.C.1, not later than 29th July, 1960.

**SOUTH EAST METROPOLITAN REGIONAL HOS-**PITAL BOARD. Applications are invited for an appointment of ASSISTANT DENTAL SURGEON (9 notional half-days weekly) to the Lewisham and Woolwich Groups of hospitals. The salary scale (age 32 or over) will be within the range £1485 7s. 4d.–£47 3s. 1d.–£1909 15s. 2d. p.a. The duties of the appointment will involve both inpatient and outpatient work. Candidates should have had a wide experience in dental surgery. Applicants may visit the hospitals concerned.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolital Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 16th July.

**SOUTH WEST METROPOLITAN REGIONAL HOS-**PITAL BOARD, SPRINGFIELD HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOSPITAL MEDICAL OFFICER required for 2 months in the first instance.

Apply: Group Secretary, Springfield Hospital, Beechcroft-road, Upper Tooting, S.W.17. Telephone BALham 1026.

**BIRMINGHAM REGIONAL HOSPITAL BOARD. Whole-**time or maximum Part-time CONSULTANT PATHOLOGIST. Duties at Hospital of St. Cross, Rugby (9 or 7 notional half-days), Coventry Laboratory (2 notional half-days), St. Luke's and St. Mary's Hospitals, Rugby (as required). Higher qualification and wide experience all branches of pathology required. Must reside in Rugby area.

Applications (15 copies), stating age, qualifications, nationality, present and previous employments, and naming 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, by 25th July, 1960.

**DEVON AND EXETER CLINICAL AREA. South-Western** REGIONAL HOSPITAL BOARD. Applications are invited for the appointment on a maximum part-time basis of a CONSULTANT GENERAL PHYSICIAN with an interest in chest diseases to cover North Devon (estimated 4 sessions in general medicine, balance in chest diseases). The successful candidate will work mainly at the North Devon Infirmary, Barnstaple, having charge of medical beds there and at Bideford and District Hospital. He will also have chest beds provided at Hawkmoor Chest Hospital and Hawley Hospital and may be required to visit other hospitals in the clinical area.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 16th July, 1960.

**KINGSTON HOSPITAL, Kingston upon Thames. King-**STON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the post of Locum ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer) for the period 25th July–20th August, 1960.

Applications, stating age, qualifications and experience, together with 2 recent testimonials, to be sent to the Physician-Superintendent of the Hospital as soon as possible.

**LIVERPOOL. MOSS SIDE HOSPITAL, Maghull, Liver-**POOL. (500 Beds, for mental defectives exhibiting conduct disorders.) Whole-time DEPUTY MEDICAL SUPERINTENDENT (Senior Hospital Medical Officer). Excellent opportunities for study, treatment, and training of behaviour disorders of all kinds and degrees. House available. Candidates may visit Hospital by appointment.

Applications, naming 3 referees, to Medical Superintendent by 8th July, 1960.

**LIVERPOOL REGIONAL HOSPITAL BOARD. Applica-**tions are invited for the post of Part-time CONSULTANT OPHTHALMOLOGIST (8 sessions) with duties at Broadgreen, Alder Hey Children's and Birkenhead General Hospitals. The successful applicant will work with the existing Senior Consultants at the hospitals. At Alder Hey Children's and Broadgreen Hospitals the Senior Consultant Ophthalmologist is Lecturer in Ophthalmology at the Liverpool University Medical School. Applicants must hold a higher surgical qualification and have wide experience in the specialty.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 55, Castle-street, Liverpool, 2, to be returned not later than 16th July, 1960.

VINCENT COLLINGE, Secretary to the Board.

**BATH CLINICAL AREA. South-Western Regional Hospital Board.** Applications are invited for the appointment of CONSULTANT RADIOLOGIST in the Bath Clinical Area as from 12th December, 1960. The appointment may be held on a whole-time or maximum part-time basis. The successful candidate will work mainly at St. Martin's Hospital and the Royal United Hospital, Bath, but will also be required to work at other hospitals in the clinical area as determined by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications, and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 16th July, 1960.

**MANCHESTER REGIONAL HOSPITAL BOARD. Maximum** Part-time CONSULTANT GERIATRICIAN to the Lancaster and Kendal Group of hospitals (mainly at Bay View Hospital, Lancaster, and Kendal Green Hospital, Kendal; 113 and 68 chronic sick beds), and Lancaster Moor Hospital, Lancaster (large mental hospital with 70 chronic sick beds; a larger number of psychogeriatric patients will also come under the geriatrician's care). Good experience in general medicine, special interest and experience in the treatment and rehabilitation of the chronic sick and higher qualifications essential. Appointee required to undertake the domiciliary investigation of patients and establish close liaison with general practitioners and local health authorities and to reside in area.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 12th July, 1960.

**MANCHESTER REGIONAL HOSPITAL BOARD. Locum** CASUALTY OFFICER required at Ashton-under-Lyne General Hospital for period 25th August–11th November, 1960. Salary in accordance with Senior Casualty Officer or Registrar grade according to qualifications and experience.

Apply, giving age, experience, qualifications, and 2 references, to the Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, General Hospital, Ashton-under-Lyne, Lancs.

**NEWCASTLE REGIONAL HOSPITAL BOARD. Consultant** ORTHOPÆDIC SURGEON, whole-time or maximum part-time, for Durham Group of hospitals—main hospital Durham County Hospital (107 orthopædic beds) with convalescent beds at Lee Hill Hospital, Lanchester. Duties also at Durham Miners' Rehabilitation Centre. Population served 135,560. Appointee will be 1 of 2 Consultants.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

**NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS** and the UNIVERSITY OF DURHAM, THE MEDICAL SCHOOL, KING'S COLLEGE, NEWCASTLE UPON TYNE. CONSULTANT BACTERIOLOGIST (whole-time) at the Royal Victoria Infirmary. Candidates must have had wide experience in bacteriology and a special interest in virology and serology would be an advantage. The successful applicant will be expected to engage in the routine services of the Department and to devote part of his time to the University teaching programme and to engage in research. The person appointed will be afforded appropriate University status and will work under the general direction of the Director of the Department, Professor C. A. GREEN, for whom he will deputise as required.

Applications (15 copies), together with the names and addresses of 3 referees, should be sent to the House Governor and Secretary, Royal Victoria Infirmary, Newcastle upon Tyne, 1, by 23rd July, 1960.

**NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** CONSULTANT ANÆSTHETIST, 5 half-days a week, Mount Vernon Hospital, Northwood, Middlesex (551 Beds). Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, before 25th July, 1960.

**OXFORD REGIONAL HOSPITAL BOARD. Locum** PSYCHIATRIST (Senior Hospital Medical Officer grade) to St. John's Hospital, Stone, near Aylesbury (865 Beds).

Applications, giving details of age, qualifications, experience, and names of 2 referees, to Secretary, 43, Banbury-road, Oxford.

**OXFORD. UNITED OXFORD HOSPITALS. Applications** invited for the post of Full-time MEDICAL OFFICER to the United Oxford Hospitals. Duties include the medical examination of the staff of the hospitals in the Group and the supervision of the health of the nurses, medical students and resident domestics. The Medical Officer would also, in cooperation with the Consultant staff, act as clinical epidemiologist and hygiene supervisor. The salary £1719 18s.–£54 12s.–£2211 6s.

Applications on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, from whom further particulars may be obtained, to be received not later than 16th July, 1960.

**REDHILL GROUP HOSPITAL MANAGEMENT COMMITTEE.** Locum Tenens CONSULTANT ANÆSTHETIST (9 half-days per week) required immediately for duties in Group.

Apply Group Secretary, Redhill Group Hospital Management Committee, Earlswood Mount, Pendleton-road, Redhill, Surrey, or telephone Redhill 3581, extension 22.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for an appointment of CONSULTANT RADIOLOGIST (whole-time or 9 notional half-days weekly) to the Bromley Group of hospitals. Candidates must have had a wide experience in the specialty and hold an appropriate diploma.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, by not later than 16th July.

**SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD** requires CONSULTANT ANÆSTHETIST (whole-time or maximum part-time) for the Farnham (Surrey) Group of hospitals. Candidates should possess F.F.A. R.C.S. Successful candidate will be required to live in Farnham area.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, by 23rd July, 1960. Applicants may visit hospitals by local arrangement.

**SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD** requires Part-time CONSULTANT E.N.T. SURGEON (6 half-days per week) for the Farnham (Surrey) Group of hospitals. Successful candidate will be required to live in Farnham area.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, by 23rd July, 1960. Applicants may visit hospitals by local arrangement.

**SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD.** Obstetrics and gynæcology. Dundee and Angus area. Applications are invited for an appointment as OBSTETRICIAN AND GYNÆCOLOGIST (Consultant) in the Dundee and Angus area based on the Dundee Teaching Hospitals (Dundee Royal Infirmary (549 Beds) and Maryfield Hospital, Dundee (370 Beds)). An honorary Lectureship in Clinical Midwifery in the University of St. Andrews will be associated with the appointment. The appointment will be on a part-time basis for a minimum of 7 notional half-days per week. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, Vernonholme, Riverside-drive, Dundee, with whom applications must be lodged not later than 18th July, 1960.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the post of CONSULTANT BACTERIOLOGIST (whole-time) to the Fife District Laboratory, presently at Cameron Hospital, near Leven. This laboratory undertakes work for all the hospitals, the general practitioners, and the public-health services of Fife.

Apply, giving particulars of age, previous experience, and qualifications, and the names of 3 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 25th July, 1960.

**SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the appointment, which will fall vacant in December, 1960, of Whole-time CONSULTANT PSYCHIATRIST AND PHYSICIAN-SUPERINTENDENT, Hartwood Mental Hospital, Shotts, Lanarkshire, and associated clinics. A house is available.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 351, Sauchiehall-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

**SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the following appointments:—

CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST at Stobhill General Hospital, Glasgow. The appointment will be whole-time or with maximum part-time sessions.

ASSISTANT ORTHOPÆDIC SURGEON at Law Hospital, Carluke. The appointment will be whole-time or on maximum part-time sessions. Salary (at age 32 and over) on the scale £1719 18s.–£54 12s.–£2211 6s. p.a.

ASSISTANT E.N.T. SURGEON at the Glasgow Royal Infirmary with duties at hospitals in the Lanarkshire area. The appointment will be whole-time or on maximum part-time sessions. Salary (at age 32 and over) on the scale £1719 18s.–£54 12s.–£2211 6s. p.a.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 351, Sauchiehall-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

**SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time** ASSISTANT CHEST PHYSICIAN for the Chesterfield and North Derbyshire Area. Duties will be undertaken at the Chesterfield Clinic and Walton Hospital (140 Beds), where there is a thoracic surgical unit in which tuberculous and non-tuberculous work is undertaken. The successful candidate will work under the direction of the Consultant Chest Physician for the Area. House available near the Hospital. Salary scale £1719 18s.–£54 12s.–£2211 6s.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield; forms to be returned by 16th July, 1960.

**SHEFFIELD REGIONAL HOSPITAL BOARD. Consultant** RADIOLOGIST (whole-time or maximum part-time) for the Rotherham and Marlborough Group of hospitals.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd July, 1960.

**SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time** SENIOR ASSISTANT PSYCHIATRIST to be designated Deputy Medical Superintendent of Balderton Hospital, near Newark, a new hospital for the mentally subnormal, with at present 252 Beds, and the Westdale Annexe with 38 Beds for children. Ground-floor, 6-roomed flat available. Salary scale £1719 18s.–£54 12s.–£2211 6s.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd July, 1960.

**JORDAN. OPHTHALMIC HOSPITAL OF ST. JOHN IN JERUSALEM, JORDAN.** OPHTHALMIC SURGEON required for the above Hospital. Salary within the range of £2000–£2500.

Further details, accommodation, travelling, &c., from the Hospital Secretary, St. John's Gate, Clerkenwell, London, E.C.1.

**WELSH REGIONAL HOSPITAL BOARD.** Whole-time CONSULTANT PSYCHIATRIST, Morgannwg Hospital, Bridgend, Glam (2359 Beds). Applicants should have wide experience in psychiatry, hold a Diploma in Psychological Medicine. Successful candidate will participate in the work of the Associated Outpatient Clinics and Domiciliary Consultant Service in the area served by the hospital. No accommodation available.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff, within 21 days.

**WELSH REGIONAL HOSPITAL BOARD.** Second CONSULTANT in General Surgery, to Bridgend General Hospital (74 surgical beds). Successful candidate will be required to live within the Mid Glamorgan Hospital Management Committee area. Further particulars available upon request. Optional whole-time/maximum part-time appointment.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

**WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the post of Locum CONSULTANT E.N.T. SURGEON for 2 sessions per week, to be arranged with the successful applicant by local discussion. Immediate vacancy.

Applications to the Group Secretary, Kipling Memorial Building, Alma-road, Windsor.

**NEW ZEALAND. PALMERSTON NORTH HOSPITAL BOARD, PALMERSTON NORTH, NEW ZEALAND.** Applications are invited from registered medical practitioners for the position of Whole-time RADIOLOGIST in charge of the Diagnostic X-ray Department at the Palmerston North Hospital, New Zealand. Applicants must have had practical experience in diagnostic radiology and should hold a higher qualification in this specialty in order to qualify either as a Senior or as a Junior Specialist under the Hospital Employment (Medical Officers) Regulations, 1957.

Salary (New Zealand currency) :—
Senior Specialist—Scale (b) £2400–£2650 p.a. ; or
Scale (c) £2100–£2400 p.a.
Junior Specialist £1700–£2000 p.a.

Conditions of appointment are obtainable from the Offices of the N.Z. Government, 415, Strand, London, W.C.2.

Applications, giving full particulars as to age, qualifications and experience and accompanied by recent testimonials and advice as to the earliest date on which appointment could be taken up, to be addressed to the Secretary, Palmerston North Hospital Board, P.O. Box 607, Palmerston North, New Zealand.

R. S. WILSON, Secretary.

## Hospital Services: Junior Appointments

**ACTON HOSPITAL, Gunnersbury-lane, W.3. Resident** HOUSE PHYSICIAN required—post-registration Senior House Officer grade. Post vacant 4th July. Ministry of Health conditions of service.

Applications to Hospital Secretary within 7 days.

**ACTON HOSPITAL, Gunnersbury-lane, W.3. Part-time** MEDICAL REGISTRAR required for 3 sessions per week for inpatient and outpatient duties. Post vacant 16th September, 1960. Ministry of Health conditions of service. Salary pro rata to whole-time scale.

Application forms from and returnable to Group Secretary, at Central Middlesex Hospital, Park Royal, N.W.10, within 7 days.

**ALBERT DOCK ORTHOPÆDIC AND FRACTURE HOSPITAL, Alnwick-road, E.16. SEAMEN'S HOSPITALS GROUP.** SENIOR HOUSE OFFICER for Receiving Room duties required on 15th July. Post, which is normally resident, is recognised by the Royal College of Surgeons, and provides excellent experience in a wide variety of traumatic conditions received from the adjacent dockland and from shipping to the Port of London. Salary £852 6s.

Applications, stating age, nationality, qualifications and experience, with the names of 2 recent referees, should be sent to the Secretary, Dreadnought Seamen's Hospital, Greenwich, S.E.10, not later than 2nd July.

**BATTERSEA AND PUTNEY GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** ANÆSTHETIC REGISTRARS (2) for 1 year in the first instance. Duties, at each of the hospitals in the group, to be arranged with the Consultant staff. Residence optional.

Forms of application, obtainable from the Group Secretary, Battersea and Putney Group Hospital Management Committee, St. John's Hospital, St. John's Hill, S.W.11, to be returned completed within 14 days of this advertisement.

**BROMPTON HOSPITAL, S.W.3. Applications invited** for the following posts :—

RESIDENT HOUSE PHYSICIAN. 2 vacancies for 6 months from 1st September, 1960. Duties include work in Outpatient Department and wards. 1 of the successful candidates may also be required to undertake duties in E.N.T. Department. Salary at the rate of £600 12s. p.a.

RESIDENT HOUSE PHYSICIAN to Cardiac Department for 6 months from 1st September, 1960. Duties include work in Outpatient Departments and wards. Salary at the rate of £600 12s. p.a.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 9th July, 1960, to KENNETH A. F. MILES, House Governor.

**CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.)** Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Salary £852 6s. p.a. less £150 p.a. for board, lodging, &c.

Applications, with full details, and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

**CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.)** HOUSE SURGEON required for 6 months. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

**CENTRAL MIDDLESEX HOSPITAL, Park Royal, London, N.W.10.** REGISTRAR (whole-time) required in General Medical and Neurological Department. Duties include undergraduate teaching. Resident when on duty. Post vacant 1st September, 1960. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable by 7th July, 1960, to Group Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, London, N.W.10.

**CHARING CROSS HOSPITAL GROUP.** Whole-time SENIOR REGISTRAR in the Radiological Department. To work at Charing Cross Hospital and other hospitals in the Group. Tenable from 10th September, 1960.

Applications, on forms obtainable from the undersigned, to be returned by 15th July, 1960.

FRANK HART, Secretary to the Board.

Charing Cross Hospital, London, W.C.2.

**CHINGFORD HOSPITAL, London, E.4. (104 Beds.)** RESIDENT HOUSE PHYSICIAN required for 6 months with duties at other hospitals in the Group. Post vacant 16th August, 1960.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

**FULHAM HOSPITAL. Charing Cross Group of Hospitals.** SENIOR HOUSE SURGEON to the Orthopædic and Accident Department. The post is recognised for the final F.R.C.S. examination and provides wide experience in orthopædic and accident surgery with ample opportunity for post-graduate study. Resident post, vacant 11th July, 1960.

Applications, on forms obtainable from the Secretary, Fulham Hospital, St. Dunstan's-road, Hammersmith, London, W.6, to be submitted by 4th July, together with copies of 2 testimonials.

FRANK HART, Secretary to the Board.

Charing Cross Hospital.

**GROUP LABORATORY, MILE END HOSPITAL, Bancroft-road, London, E.1.** RESIDENT ASSISTANT PATHOLOGIST (Senior House Officer grade). Previous experience an advantage but not essential. Laboratory recognised for Diploma of Pathology and is well equipped with excellent training facilities.

Applications, stating age, nationality, qualifications, experience, with copies of not more than 3 testimonials, to be sent to the Secretary, Stepney Group Hospital Management Committee, Mile End Hospital, Bancroft-road, E.1, not later than 30th June, 1960.

**GUY'S HOSPITAL, S.E.1. Applications are invited for** the post of REGISTRAR (middle grade) in the Department of Diagnostic Radiology with duties to commence, if possible, on 2nd August. Applicants should hold a Diploma in Radiology, but applicants who are taking Part II of the Diploma in October are eligible to apply. Appointment will be for a period of 1 year in the first instance.

Forms of application are available from and should be lodged with the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 7th July, 1960.

**GUY'S HOSPITAL, London Bridge, S.E.1. Applications** are invited for the post of JUNIOR REGISTRAR (Senior House Officer grade) in the Ophthalmology Department. The officer would be occupied full-time in the Department, which is staffed by 2 Consultants and 3 Registrars (part-time).

Forms of application are obtainable from and should be lodged with the Superintendent, Guy's Hospital, S.E.1, not later than 7th July, 1960.

**GUY'S-MAUDSLEY NEUROSURGICAL UNIT. Applications** are invited for the resident post of SENIOR HOUSE OFFICER for 6 months commencing on 1st August, 1960. The Unit, which is housed in Maudsley Hospital, serves both Guy's Hospital, and the Bethlem Royal and the Maudsley Hospitals.

Applications should be made by 9th July to K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark Hill, S.E.5.

**HALLIWICK HOSPITAL, New Southgate, N.11. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** REGISTRAR in Psychiatry at this new informal hospital of 134 Beds for early recoverable cases with full outpatient and day-hospital facilities. Appointment may include a tour of duty in Friern Hospital, in the same Group. Experience in general medicine and psychiatry necessary. Hospitals may be visited by appointment.

Application forms obtainable from and returnable to Group Secretary, New Southgate Group Hospital Management Committee, 52, Friern Barnet-road, London, N.11, within 14 days.

**HALLIWICK HOSPITAL, New Southgate, London, N.11. NEW SOUTHGATE GROUP HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER required for 1-year appointment at this new informal hospital of 134 Beds for early recoverable cases with full outpatient and day-hospital facilities.

Applications by letter, giving full particulars, and naming 2 referees, to Group Secretary, New Southgate Group Hospital Management Committee, 52, Friern Barnet-road, N.11, within 14 days.

**HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. ROYAL FREE HOSPITAL GROUP.** Applications are invited from registered medical practitioners for the post of Whole-time NON-RESIDENT SENIOR REGISTRAR in Clinical Pathology at the Hampstead General Hospital. Appointment for 1 year in the first instance, from 1st September, 1960. Experience in clinical pathology is essential, and in addition special interest in biochemistry would be an advantage.

Application forms may be obtained from the Secretary, to whom they should be returned by 30th June, 1960.

**HAMMERSMITH HOSPITAL AND POSTGRADUATE** MEDICAL SCHOOL, Ducane-road, London, W.12. RESIDENT HOUSE SURGEON (radiotherapy) required 27th August. This post offers opportunities for attending general surgical post-graduate teaching.

Detailed applications, copies 2 recent testimonials, to Secretary, Board of Governors, Hammersmith Hospital, Ducane-road, London, W.12, immediately.

**HAMMERSMITH HOSPITAL AND POSTGRADUATE** MEDICAL SCHOOL, Ducane-road, London, W.12. Locum NON-RESIDENT CASUALTY OFFICER (Senior House Officer grading) required for 1 month from 1st September.

Detailed applications, copies 2 recent testimonials, to Secretary, Board of Governors, Hammersmith Hospital, Ducane-road, London, W.12, by 4th July.

**HIGHLANDS GENERAL HOSPITAL, Winchmore Hill,** N.21. ANÆSTHETIST (Senior House Officer grade), resident. 12-month appointment, vacant 24th August. Recognised for D.A.

Apply with copies of recent testimonials and name and address of 1 referee to Hospital Secretary.

**HIGHLANDS GENERAL HOSPITAL, Winchmore Hill,** London, N.21. Applications are invited from pre- or post-registration medical practitioners for the post of HOUSE SURGEON, vacant 17th July, 1960. 50 surgical beds. New operating-theatre, outpatient and casualty departments.

Applications, with 2 testimonials and name and address of 1 referee, to Hospital Secretary.

**HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60,** Grove End-road, London, N.W.8. Required to commence on Monday, 5th September, Full-time SURGICAL REGISTRAR (Male). The possession of the Diploma of Fellow of one of the Royal Colleges is desirable. Honorarium at the rate of £850 p.a. Appointment will be for a period of 12 months.

Further particulars may be obtained from the Secretary, to whom applications, with names of 3 referees, should be sent on or before Monday, 11th July.

**KING'S COLLEGE HOSPITAL, Denmark Hill, S.E.5.** Applications are invited for the appointment of SENIOR REGISTRAR in Psychiatry at King's College Hospital, vacant from 1st October, 1960. Preference will be given to applicants holding a higher medical qualification and a D.P.M.

Applications, quoting age, education, qualifications and experience, and giving the names of 2 referees, should be sent to the undersigned by 9th July, 1960.

J. D. BANKS, House Governor.

**KING EDWARD MEMORIAL HOSPITAL. South West** MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) for duties at King Edward Memorial Hospital and associate hospitals. Resident. Vacant 1st August, 1960. Resident Registrar employed. Post recognised for D.A. and F.F.A. R.C.S. examinations.

Apply, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Hospital Secretary, King Edward Memorial Hospital, Mattock-lane, Ealing, W.13, by 4th July.

**LAMBETH HOSPITAL, Brook-drive, S.E.11. Locum** CASUALTY OFFICER required, 4th–17th July. Senior House Officer grade. Resident or non-resident.

Applications to the Secretary, enclosing 2 testimonials, or telephone RELiance 3804.

**LEWISHAM GROUP LABORATORY, LEWISHAM HOSPITAL,** London, S.E.13. Applications are invited for 1 of 2 posts of SENIOR HOUSE OFFICER in Pathology. The appointment may be either fully resident or resident only when on duty.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, to the Group Secretary, Lewisham Hospital, S.E.13.

**LONDON JEWISH HOSPITAL, Stepney Green, E.1.** (124 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant 28th July, 1960. 6-month appointment.

Applications, stating age, qualifications, experience, and enclosing copies of not more than 3 testimonials, to be sent to the Hospital Secretary not later than 5th July, 1960.

**MILDMAY MISSION HOSPITAL, Austin-street, London,** E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE PHYSICIAN/CASUALTY OFFICER. Vacant July, 1960. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

**MILDMAY MISSION HOSPITAL, Austin-street, London,** E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE SURGEON (post recognised for F.R.C.S.), vacant July, 1960. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

**MILE END HOSPITAL, Bancroft-road, London, E.1.** (476 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant 27th July, 1960.

Application forms, obtainable from Physician-Superintendent, to be returned by 8th July, 1960, with copies of not more than 3 testimonials.

*AMENDED ADVERTISEMENT*

**MIDDLESEX HOSPITAL, W.1, and THE NORTH WEST** METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Plastic Surgery, for 5 sessions a week at the Middlesex Hospital, W.1; and 6 sessions a week at Mount Vernon Hospital, Northwood, under the control of the North West Metropolitan Regional Hospital Board.

Forms of application obtainable from the Deputy Superintendent, Middlesex Hospital, should be returned to him, naming 2 referees, by 11th July.

**MIDDLESEX HOSPITAL, W.1. Applications invited for** the post of SENIOR HOUSE OFFICER to the Department of Radiology.

Forms of application, obtainable from the Deputy Superintendent, should be returned, naming 2 referees, by 8th July.

**MOTHERS' HOSPITAL (SALVATION ARMY), London,** E.5. (Maternity, 110 Beds.) Locum SENIOR HOUSE OFFICER (obstetrics), resident, required immediately for period ending 17th July, 1960. Previous obstetric experience necessary.

Apply Hospital Secretary, above address.

**NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.**

**Oldchurch Hospital, Romford, Essex**

SURGICAL REGISTRAR. Resident or non-resident. Recognised for F.R.C.S.

**Poplar Hospital, London, E.14**

SURGICAL REGISTRAR. Resident or non-resident. Recognised for F.R.C.S.

**Essex County Hospital, Colchester, Essex**

•CASUALTY, ORTHOPÆDIC AND FRACTURE REGISTRAR. Resident or non-resident. Recognised for F.R.C.S.

**Hackney Hospital, London, E.9**

REGISTRAR in Obstetrics and Gynæcology. Resident. Recognised for M.R.C.O.G. Previous experience essential.

**Prince of Wales's General Hospital, London, N.15**

REGISTRAR in Obstetrics and Gynæcology. Resident or non-resident.

**Tottenham Group of Hospitals, London, N.15**

PÆDIATRIC REGISTRAR. Non-resident. Duties include 2 sessions at a Local Authority Infant Welfare Clinic and neonatal work.

**General Hospital, Southend-on-Sea, Essex**

PÆDIATRIC REGISTRAR. Resident or non-resident. Previous pædiatric experience essential. Vacant approximately 1st August.

Appointments subject to review after 1 year.

Application forms from Secretary, North East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, to be returned not later than 9th July.

**NORTH MIDDLESEX HOSPITAL, London, N.18. Obstetric** AND GYNÆCOLOGICAL HOUSE SURGEON required for 6 months, starting 1st August, 1960. Resident. Fully qualified or pre-registration (second post) candidates may apply. Post recognised by R.C.O.G. for Diploma and as a combined post for Membership. Large obstetric and gynæcological department.

Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, should reach the Secretary of the Hospital by 30th June, 1960.

**NORTH MIDDLESEX HOSPITAL, London, N.18. Resi-**DENT HOUSE PHYSICIAN, pre-registration, required for 1st August, 1960, for 6 months. General medicine.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, should reach the Secretary of the Hospital by 30th June.

**NORTH MIDDLESEX HOSPITAL, London, N.18. Senior** HOUSE OFFICER for Thoracic Surgical Unit (a regional thoracic centre) required for 6 months from 1st August, 1960. The post, which is resident, is recognised for F.R.C.S. and offers experience in all varieties of cardiac, œsophageal, and non-tuberculous pulmonary surgery.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials, and names of 2 referees, to Secretary of Hospital by 30th June, 1960.

**NORTH MIDDLESEX HOSPITAL, London, N.18. Casualty** OFFICER (Senior House Officer grade). Required on 1st August, 1960. 6-month appointment with possible extension to 1 year. Non-resident. Post recognised for F.R.C.S. 3 Casualty Officers employed. Duties include service with the 3 main surgical units.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials and the names of 2 referees, to the Secretary of Hospital, not later than 6th July, 1960.

**POPLAR HOSPITAL, East India Dock-road, London,** E.14. RESIDENT SENIOR HOUSE OFFICER (Physician) required 1st August, 1960.

Applications, giving full details, to Group Secretary, St. Clement's Hospital, Bow-road, E.3.

**PRINCE OF WALES'S GENERAL HOSPITAL, N.15.** CLINICAL ASSISTANT (Honorary) to General Medical Department at the above Hospital required for 1 session a week, Thursday afternoons.

Applications, giving details of qualifications and experience, &c., to Group Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15.

**PRINCE OF WALES'S GENERAL HOSPITAL, N.15.** RESIDENT JUNIOR HOUSE SURGEON (pre-registration) required at the above Hospital for 6 months from 14th July, 1960.

Applications, giving full details of name, address, age, qualifications and experience, together with names of 2 referees, to Group Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, by first post on 29th June, 1960.

**PADDINGTON GENERAL HOSPITAL, Harrow-road,** W.9. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade), recognised F.R.C.S. Busy modern department. Non-resident, resident on duty only.

Applications, stating age, experience and qualifications, together with names and addresses of 2 referees, to be forwarded immediately to the Hospital Secretary.

**PADDINGTON GENERAL HOSPITAL, Harrow-road,** W.9. (582 Beds.) Applications are invited for the post of REGISTRAR (obstetrics—gynæcology), commencing 1st September, 1960. Whole-time, resident post, recognised for M.R.C.O.G. Department contains 100 obstetric and 38 gynæcological beds. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to the Group Secretary, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 4th July, 1960.

**PADDINGTON GREEN CHILDREN'S HOSPITAL.** St. MARY'S HOSPITAL, W.2. Applications are invited for the post of CASUALTY OFFICER. Post-registration appointment, non-resident, House Officer grade, tenable for 6 months starting 1st July, 1960.

Applications, stating age, nationality, qualifications with dates and experience, with copies of 3 recent testimonials, should be sent to the Secretary immediately.

**PUTNEY HOSPITAL, Lower Common, S.W.15.** House PHYSICIAN, resident, Male or Female. Vacant immediately. Open to pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials.

**QUEEN MARY'S HOSPITAL FOR THE EAST END,** Stratford, E.15. HOUSE PHYSICIAN (third post) required for 2 general medical inpatient wards at Plaistow Hospital. Inpatient work only at present. 6 months commencing 1st August, 1960. Suitable for postgraduate study for higher diploma in medicine.

Apply to Hospital Secretary, giving the names of 2 referees, as soon as possible.

**ROYAL MARSDEN HOSPITAL, Fulham-road, S.W.3.** Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer) to commence duty in August. The appointment is for a period of 12 months. Preference will be given to Fellows of the Royal College of Surgeons.

Application forms obtainable from the House Governor, to whom they should be returned, together with copies of 3 recent testimonials, not later than 8th July.

**ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234,** Great Portland-street, London, W.1. Applications are invited for the appointment of ORTHOPÆDIC REGISTRAR (full-time), non-resident. Preference will be given to candidates with a higher surgical qualification. Registrars are liable for secondment to Peace Memorial Hospital, Watford, and/or Barnet General Hospital for periods of 6 months during their tenure of appointment.

Applications to be received not later than 1st July, 1960. Forms of application can be obtained from the House Governor, 234, Great Portland-street, London, W.1.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for a whole-time appointment as RESIDENT MEDICAL OFFICER in the Seamen's Group of hospitals. The post is recognised for the M.R.C.P. examination. Married quarters are available. The salary will be £1103 19s. p.a. (second year Registrar rate) and the appointment will be for 1 year in the first instance, renewable for a further year.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 9th July.

**SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN,** Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Women medical practitioners for the post of ANÆSTHETIC REGISTRAR (prepared to live within 20 minutes of the Hospital). Vacant now. Post recognised for F.F.A. R.C.S. and D.A. Appointment normally for 2 years, but subject to review at end of 1 year. Candidates invited to visit the Hospital by local arrangement.

Forms of application from the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 9th July, 1960.

**SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** REGISTRAR in Anæsthetics for duties at St. Stephen's and Princess Beatrice Hospitals. Whole-time, non-resident post, recognised for F.F.A. R.C.S. Vacancy 1st August.

Application forms from the Group Secretary, St. Luke's Hospital, Chelsea, S.W.3.

**ST. ANDREW'S HOSPITAL, Devons-road, E.3.** House SURGEON required for duties in the Ophthalmic Department and Casualty Unit; applicants must be fully registered.

Applications, with copy of at least 1 testimonial, to Hospital Secretary, immediately.

**ST. ANN'S GENERAL HOSPITAL, N.15.** Applications are invited for the appointment of RESIDENT HOUSE SURGEON (Senior House Officer) to above Hospital for a period of 6 months from 23rd July, 1960. Post recognised for F.R.C.S. examination.

Application form from Group Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, to be returned by 6th July, 1960.

**ST. BENEDICT'S HOSPITAL, Church-lane, Tooting,** S.W.17. SENIOR HOUSE OFFICER (resident) required for active Geriatric and Rehabilitation Unit. Post vacant now. Adequate time to study for M.R.C.P. examination together with clinical cases and teaching.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, St. James' Hospital, Balham, S.W.12.

**ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (575** Beds.) SENIOR HOUSE OFFICER for Gynæcology, E.N.T., and Ophthalmology required. Opportunity for ward and out-patient clinic experience.

Applications, with names and addresses of 2 referees, to Hospital Secretary within 10 days of the date of this advertisement.

**ST. GILES' HOSPITAL, Camberwell, S.E.5.** Applications are invited for appointment to the post of SENIOR HOUSE OFFICER (general medical duties).

Apply, giving age, qualifications and experience, with copy testimonials or names of 2 referees, within 7 days to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22.

**ST. GEORGE'S HOSPITAL, S.W.1, and ST. HELIER** HOSPITAL. Joint Senior Registrar in Anæsthetics. Applications are invited for the post of SENIOR REGISTRAR to the Department of Anæsthetics. This is a joint appointment between St. George's Hospital, Hyde Park Corner, and the St. Helier Hospital, Carshalton. Candidates should hold the diploma of Fellowship of the Faculty of Anæsthetists. This is a full-time appointment, non-resident except for certain emergency duties, and the successful candidate will be required to take up duty on or about 1st September, 1960. The appointment is renewable up to 4 years, of which 1 year will be spent at St. George's.

Applications, stating age, education, qualifications, experience, and the names and addresses of 2 referees, should reach the undersigned not later than 8th July, 1960.

P. H. CONSTABLE, House Governor.

**ST. JAMES' HOSPITAL, Balham, London, S.W.12. South** WEST METROPOLITAN REGIONAL HOSPITAL BOARD. WANDSWORTH HOSPITAL GROUP. ANÆSTHETIC REGISTRAR required 1st September. Post recognised for F.F.A. R.C.S.

Application forms, obtainable from Group Secretary at above address, to be completed and returned by 11th July.

**ST. JAMES' HOSPITAL and WEIR MATERNITY HOSPITAL.** SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (obstetrics and gynæcology) required 29th August for Group Maternity Unit—56 obstetric beds, 42 gynæcology beds and large outpatient clinics. Post recognised for M.R.C.O.G. Duties at both hospitals.

Application forms, obtainable from Group Secretary, Wandsworth Hospital Group, St. James' Hospital, Balham, S.W.12, to be completed and returned by 11th July.

**ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. South** WEST METROPOLITAN REGIONAL HOSPITAL BOARD. OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR. Resident. Recognised for M.R.C.O.G. Vacancy 1st August.

Application forms from the Group Secretary, St. Luke's Hospital, Chelsea, S.W.3.

**TAVISTOCK CLINIC, 2, Beaumont-street, W.1.** Applications are invited for the whole-time post, commencing 19th September, 1960, of PSYCHIATRIC REGISTRAR in the Department for Children and Parents. The Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 4th July, 1960.

**TAVISTOCK CLINIC, 2, Beaumont-street, W.1.** Applications are invited for 2 whole-time posts of REGISTRAR in Psychiatry (Adult Department), commencing 1st October, 1960. Posts are for those intending to specialise in psychotherapy and good general experience in psychiatry required. Preference given to candidates possessing D.P.M. Successful applicants may be offered assistance for obtaining personal analysis during appointment.

Application forms obtainable and returnable to the Secretary, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 4th July, 1960.

**THE HOSPITAL FOR SICK CHILDREN, Great Ormond-**street, London, W.C.1. There will be a vacancy on 5th September, 1960, for a Whole-time SENIOR REGISTRAR to the E.N.T. Department.

Further particulars and application form, to be returned by 6th July, 1960, obtainable from the House Governor.

**THORPE COOMBE MATERNITY HOSPITAL, Walthamstow, E.17.** (70 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER, vacant 26th July, 1960. Experience in obstetrics is essential. The appointment is recognised for Membership and D.Obst.R.C.O.G. as an obstetrical post. Salary £852 6s. p.a., less £150 p.a. for board-residence.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

**THORPE COOMBE MATERNITY HOSPITAL, Walthamstow, E.17.** (70 Beds.) Applications are invited for the post of HOUSE OFFICER. Vacant 10th August, 1960. The appointment is recognised for D.Obst.R.C.O.G. as an obstetrical post.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

**THORPE COOMBE MATERNITY HOSPITAL, 714,** Forest-road, Walthamstow, E.17. Locum RESIDENT ANÆSTHETIST (Registrar) required.

Apply in writing, with copies of 2 recent testimonials, to Secretary.

**UNIVERSITY COLLEGE HOSPITAL, Gower-street,** London, W.C.1. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER to the Department of Psychological Medicine for 6 months from 4th September, 1960.

Applications, with names of 2 referees, to T. F. W. MACKEOWN, Administrator and Secretary, by 8th July, 1960.

**WHIPPS CROSS HOSPITAL, Leytonstone, E.11. Leyton-**STONE (NO. 10) HOSPITAL GROUP. Applications are invited for the post of Pre-registration HOUSE PHYSICIAN (general medicine) at above Hospital. This post becomes vacant 15th August, 1960.

Application forms, obtainable from the Hospital Secretary, to be returned by 5th July, 1960.

**WHITTINGTON HOSPITAL, London, N.10.** Applications are invited for the post of SENIOR HOUSE OFFICER (resident) for E.N.T. Department. Post recognised for D.L.O. Vacant now.

Application forms obtainable from Group Secretary, 46, Cholmeley Park, London, N.6 (ARChway 3070, extension 526/7), and returnable to the Medical Superintendent as soon as possible.

**WESTMINSTER HOSPITAL, London, S.W.1. 2 Medical** REGISTRARS required for 1 year in first instance. 1 post vacant from 12th September, and the other one vacant mid/end September.

Applications (7 copies), with names of 2 referees, to House Governor by 9th July.

**WESTMINSTER HOSPITAL, London, S.W.1.** Applications invited for post of RESIDENT CASUALTY OFFICER (Senior House Officer grade) with duties as House Physician in Skin Department for 1 year from beginning of September. Board-residence £150 p.a.

Applications (8 copies), with names of 2 referees, to House Governor by 9th July.

**WESTERN HOSPITAL, Seagrave-road, Fulham, S.W.6.** Applications are invited for appointment as REGISTRAR (infectious diseases). Post now vacant. The Infectious Diseases Unit includes a regional centre for the treatment of respiratory complications of poliomyelitis, and there are excellent facilities for research. The Hospital is well situated for those wishing to pursue postgraduate studies. Experience in infectious diseases desirable but not essential, but good pædiatric or general medicine experience is acceptable. Duties will also allow of some responsibility for patients in the chest wards. Candidates may visit the hospital by arrangement with the Physician-Superintendent.

Applications (3 copies) to be submitted immediately on forms obtainable from the Acting Group Secretary (2DL), 5, Collingham-gardens, S.W.5.

**WEST LONDON HOSPITAL, Hammersmith-road, W.6.** CHARING CROSS GROUP OF HOSPITALS. CASUALTY OFFICERS (Senior House Officer grade), resident, posts recognised for Primary F.R.C.S.

Detailed applications, with names of referees, to the Secretary, West London Hospital, Hammersmith-road, W.6, by 1st July, 1960.

**WEST LONDON HOSPITAL, Hammersmith-road, W.6.** CHARING CROSS GROUP OF HOSPITALS. MEDICAL REGISTRAR required 1st October; higher qualification desirable. The post is non-resident but a house would be available at a reasonable rental if the successful candidate should require it.

Applications and names of 3 referees to FRANK HART, Secretary, Board of Governors, Charing Cross Hospital, London, W.C.2, by 1st July, 1960.

**ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT.** Applications are invited for the appointment as from September, 1960, of a REGISTRAR in Obstetrics and Gynæcology. The post is recognised in both obstetrics and gynæcology for the M.R.C.O.G. The holder of this post will work in the Professorial Unit, and rotation of duties is arranged to meet the needs of clinical training at the Aberdeen Royal Infirmary, Aberdeen Maternity Hospital, and Woodend General Hospital, Aberdeen. The post is a whole-time one and the conditions of service are in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Group Secretary and Treasurer, Aberdeen General Hospitals, P.O. Box 92, Foresterhill House, Ashgrove-road West, Aberdeen, by Tuesday, 12th July, 1960.

**ALTON GROUP HOSPITAL MANAGEMENT COMMITTEE.** Locum JUNIOR HOSPITAL MEDICAL OFFICER required to undertake routine hospital duties at the Lord Mayor Treloar Hospital, with an opportunity of gaining experience in orthopædics, and certain Casualty Officer duties at the Alton General Hospital. The post is available immediately and accommodation for either single or married applicant is available.

Applications should be sent to the Group Secretary, Lord Mayor Treloar Hospital, Alton, Hants.

**ALTON GROUP HOSPITAL MANAGEMENT COMMITTEE.** WESSEX REGIONAL HOSPITAL BOARD. REGISTRAR in General Surgery (Registrar grade) required at the Alton General Hospital (136 Beds) with duties as required at other hospitals in the Group. The post is resident or non-resident (married accommodation available) and is recognised for F.R.C.S. Appointment vacant mid-August.

Application form obtainable from the Group Secretary, Lord Mayor Treloar Hospital, Alton, Hants.

**ALTON GROUP HOSPITAL MANAGEMENT COMMITTEE.** WESSEX REGIONAL HOSPITAL BOARD. REGISTRAR in Anæsthetics (Registrar grade) required by the above Group for duties at the Alton General, Henry Gauvain, and Lord Mayor Treloar hospitals. Post recognised for the F.F.A. R.C.S. Resident or non-resident (married accommodation available). Vacant August.

Application form obtainable from Group Secretary, Lord Mayor Treloar Hospital, Alton, Hants.

**ALTRINCHAM GENERAL HOSPITAL. St. Anne's E.N.T. Department,** ALTRINCHAM, CHESHIRE. (53 Beds.) REGISTRAR required (preferably resident). Vacant 1st August, 1960. This post offers excellent opportunities of practical experience and is recognised under F.R.C.S. regulations.

Applications to be forwarded, with names of 2 referees, to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

**ALTRINCHAM GENERAL HOSPITAL and ANNEXE.** (130 Beds.) NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following pre-registration posts which are vacant at this Hospital on 1st August, 1960 :—

HOUSE OFFICER (medical).
HOUSE OFFICER (surgical).

Applications, with full particulars, including the names and addresses of 3 referees, to the Hospital Secretary, Altrincham General Hospital, Market-street, Altrincham, Cheshire.

**ALTRINCHAM GENERAL HOSPITAL and ANNEXE** and E.N.T. DEPARTMENT. (183 Beds.) NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical). This appointment in a busy Hospital offers excellent opportunities of practical experience.

Applications, together with names and addresses of 3 referees, to Hospital Secretary, Altrincham General Hospital, Market-street, Altrincham, Cheshire.

**ABERYSTWYTH GENERAL HOSPITAL.** Applications are invited for the post of HOUSE PHYSICIAN. Pre-registration or post-registration. Post vacant end of August. Residential facilities for family can be provided.

Applications to Hospital Secretary immediately.

**ASHTON-UNDER-LYNE GENERAL HOSPITAL. Junior** HOSPITAL MEDICAL OFFICER (resident) required for Casualty Department. Appointment limited to 4 years. Minimum commencing salary £886 12s. p.a., but higher salary may be paid according to experience and qualifications. There may be some orthopædic duties to be undertaken by the holder of this post. Recognised under F.R.C.S. regulations.

Apply, giving age, experience, qualifications, and 2 references, to Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, General Hospital, Ashton-under-Lyne.

**ASHTON-UNDER-LYNE GENERAL HOSPITAL.** ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general medicine) and HOUSE PHYSICIAN (general medicine) required at above Hospital. 74 acute medical beds. Good experience. Both vacant August. Preference given to pre-registration candidates for junior post.

Applications (with copies of 2 testimonials) to Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

**AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL.** HOUSE OFFICER required for Pædiatric Department (18 medical beds). Post vacant 17th July. Additional pædiatric duties in Infectious Diseases Unit, Plastic Unit, and Outpatient Department. Post qualifies for D.C.H.

Applications from registered and pre-registration candidates, together with 2 testimonials, to be forwarded to Administrative Officer.

**AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL.** RESIDENT HOUSE PHYSICIAN required for Department of General Medicine. Duties include responsibility for 6 dermatology beds. Pre-registration appointment but registered practitioners may apply. Post vacant now.

Applications, with copies of 2 testimonials, to be forwarded to the Administrative Officer immediately.

**AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL.** SENIOR HOUSE OFFICER required for Regional Rheumatism Research Centre. Post, which will give opportunities for research, is vacant now.

Applications, with copies of 2 testimonials, to Administrative Officer immediately.

**AYR. SEAFIELD SICK CHILDREN'S HOSPITAL. (112 Beds.)** SENIOR HOUSE OFFICER (pædiatrics). Vacant 1st August, resident. National terms. Offers wide experience under Consultant supervision. Recognised D.C.H. Tenable for 6 months or a year by agreement.

Applications, with names of 2 referees, to Area Medical Superintendent, Ballochmyle Hospital, Mauchline, Ayrshire.

**AYR. SEAFIELD SICK CHILDREN'S HOSPITAL. (112 Beds.)** SENIOR HOUSE OFFICER (surgical). Vacant 1st August, resident. National terms. Offers wide experience under Consultant supervision. Recognised D.C.H. Tenable for 6 months or a year by agreement.

Applications, with names of 2 referees, to Area Medical Superintendent, Ballochmyle Hospital, Mauchline, Ayrshire.

**BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL.** Applications are invited for the resident post of HOUSE OFFICER (pre-registration), or Locum SENIOR HOUSE OFFICER for period of 2 months, in the General Surgical Department at the North Lonsdale Hospital, Barrow-in-Furness. Post available early July.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness.

**BATLEY. THE GENERAL HOSPITAL, Carlinghow Hill,** BATLEY, YORKSHIRE. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) which is now vacant. In association with the Senior Casualty Officer to the Group, the person appointed will be employed in the Casualty Department at the main orthopædic unit. The post is for a period of 6 months in the first instance and is resident.

Applications, with full details of present appointment and experience, together with the names and addresses of 2 referees, should be forwarded to the Administrative Officer at the Hospital immediately.

**BEDFORD GENERAL HOSPITAL. (424 Beds.) House** SURGEON for Orthopædic and Casualty duties. Pre- or post-registration. Recognised for F.R.C.S. This post would be convenient for those studying for examination as it is in easy reach of London and adequate library facilities are available at the Hospital.

Applications with copies of 2 recent testimonials to be sent immediately to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

**BEDFORD GENERAL HOSPITAL. (424 Beds.) Locum** Tenens SENIOR HOUSE OFFICER (general surgery).

Applications to Group Secretary, Bedford Group Hospital Management Committee, Kimbolton-road, Bedford (telephone Bedford 5401, extension 22).

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) HOUSE SURGEON (House Officer or Senior House Officer grading according to experience). Vacant beginning August. Offers good opportunity for general experience in busy acute general hospital. Recognised for F.R.C.S. Approved pre-registration post but fully registered practitioners may apply. Married accommodation may be available.

Applications to Group Secretary.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) HOUSE PHYSICIAN (vacant early August). Senior House Officer or House Officer grading according to experience. Pre-registration post but fully registered practitioners may apply. Married quarters may be available.

Detailed applications to Group Secretary.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (vacant now.) Senior House Officer or House Officer grading according to experience. Orthopædic and casualty work. Recognised for F.R.C.S. Pre-registration post but fully registered practitioners may apply. Married quarters may be available.

Detailed applications to Group Secretary.

**BIRMINGHAM, 9. LITTLE BROMWICH GENERAL** HOSPITAL. HOUSE SURGEON (Male/Female). 2 vacancies early July. Pre-registration appointment.

Apply Physician-Superintendent with copies of 2 testimonials or names of referees.

**BIRMINGHAM, 9. LITTLE BROMWICH GENERAL** HOSPITAL. HOUSE PHYSICIAN (Male/Female). Vacant early July. Pre-registration appointment.

Apply Physician-Superintendent with copies of 2 testimonials or names of referees.

**BIRMINGHAM REGIONAL HOSPITAL BOARD.**

**1. Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

REGISTRAR (general medicine) for Gulson Hospital, Coventry (312 Beds). Duties mainly at Gulson Hospital. Vacant 17th July. Experience in specialty essential. Higher qualifications desirable. Resident.

**2. Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

(*a*) SURGICAL REGISTRAR, whole-time, for City General Hospital (815 Beds). Post vacant mid-August. Recognised for F.R.C.S. Work includes genitourinary, thoracic and cardiac in addition to general surgery. No casualty work. A house may be available.

(*b*) Locum SENIOR REGISTRAR required in Obstetrics and Gynæcology for City General and Limes Maternity Hospitals for period of 3 weeks, commencing on or about 11th July. 100 maternity, 40 gynæcological beds.

**3. Shrewsbury Group, Copthorne Hospital, Shrewsbury**

Locum ANÆSTHETIC REGISTRAR. Resident/non-resident. Duties mainly in Shrewsbury Group. Vacant immediately.

Application forms (Nos. 1 and 2*a*) from Group Secretaries, to be returned by 4th July, 1960.

Detailed applications with copy testimonials (Nos. 2*b* and 3) direct to Group Secretaries immediately.

**BIRMINGHAM (SANATORIA) GROUP HOSPITAL** MANAGEMENT COMMITTEE. Applications are invited for 1 of the 2 posts of JUNIOR HOSPITAL MEDICAL OFFICER at West Heath Hospital, Rednal-road, Birmingham, 31 (205 Beds for the treatment of non-tuberculous and tuberculous chest cases). Post vacant 11th July, 1960. The successful applicant will reside at the above Hospital (accommodation for single persons only), and will be offered facilities for undertaking duties at the Birmingham Chest Clinic, Great Charles-street, Birmingham, 3.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Group Secretary, Birmingham (Sanatoria) Group Hospital Management Committee, Yardley Green Hospital, Birmingham, 9.

**BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane,** SOLIHULL. OBSTETRIC HOUSE OFFICER (pre-registration). Now vacant.

Applications, with names of 2 referees or copies of testimonials, to the Medical Superintendent immediately.

**BIRMINGHAM (near). THE MIDLAND CENTRE FOR** NEUROSURGERY, Holly-lane, SMETHWICK, near BIRMINGHAM. RESIDENT SENIOR HOUSE OFFICER. This post, which combines medical neurology and neurosurgery, is recognised for a period of 6 months' unspecified training by the R.C.S. and also offers excellent experience for Membership candidates, and for those training in ophthalmology, psychiatry, and otorhinolaryngology. Vacant 8th August, 1960.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee, Edward-street, West Bromwich.

**BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS.** QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of NEUROLOGICAL REGISTRAR (non-resident) (Senior Registrar or Registrar, according to experience; M.R.C.P. essential) for duty in the United Hospitals. Candidates should have had experience in either a special neurological hospital or in a neurological department in a general hospital; general medical experience is essential.

Forms of application may be obtained from, and should be returned not later than 9th July, 1960, to the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15.

**BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS.** Applications are invited for the post of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR for duties at the Queen Elizabeth Hospital and the Birmingham and Midland Hospital for Women (Professorial Unit). Vacant in August.

Forms of application may be obtained from, and should be returned immediately to the House Governor, Birmingham and Midland Hospitals for Women, Showell Green-lane, Birmingham, 11. G. A. PHALP, Secretary.

**BIRMINGHAM. DUDLEY ROAD HOSPITAL, Birm-**INGHAM, 18. (775 Beds.) HOUSE PHYSICIAN (pædiatric). Vacant 24th August, 1960. Department, under control of 2 Consultant Pædiatricians, consists of 83 Beds and Cots and 100 neonatal cots. Facilities given for postgraduate instruction and necessary attendance at clinics. Undergraduates of Birmingham University attend department for clinical instruction. Recognised for pre-registration and D.C.H.

Applications, with copies of 3 recent testimonials, to Group Secretary.

**BIRMINGHAM. DUDLEY ROAD HOSPITAL, Birm-**INGHAM, 18. (775 Beds.) HOUSE PHYSICIANS (general medicine). Vacant 11th July and 3rd September. To work in firm of 2 Consultants, Registrar, and 2 House Physicians. Recognised for pre-registration.

Applications, with copies of 3 testimonials, to Group Secretary.

**BIRMINGHAM. DUDLEY ROAD HOSPITAL, Birm-**INGHAM, 18. (775 Beds.) HOUSE SURGEONS (general surgery). Vacant 12th and 27th July. To work in firm of 2 Consultants, Registrar, and 2 House Surgeons. Recognised for pre-registration and F.R.C.S.

Applications, with copies of 3 recent testimonials, to Group Secretary.

**BIRMINGHAM AND MIDLAND EAR AND THROAT** HOSPITAL, Edmund-street, BIRMINGHAM, 3. SENIOR HOUSE OFFICER (resident). Vacant immediately. Recognised for D.L.O. and F.R.C.S.

Applications, with copies of 3 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

**BISHOP AUCKLAND. THE GENERAL HOSPITAL.** (300 Beds.) Pre-registration HOUSE OFFICER in Medicine required.

Apply by 4th July, 1960, giving full details, and the names of 2 referees, to the Group Secretary, South West Durham Hospital Management Committee at the above address.

**BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS** AND ESSEX GENERAL HOSPITAL. (341 Beds.) SENIOR HOUSE OFFICER (surgical) required for general and orthopædic duties. Salary £852 6s. p.a., less £150 in respect of residential emoluments. Appointment to commence 2nd August, 1960, for a period of 6 months in the first instance, which is renewable for a further 6 months.

Applications, stating qualifications, nationality, age, and experience, with copies of testimonials or names of 2 referees, to Hospital Secretary.

**BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS** AND ESSEX GENERAL HOSPITAL. (341 Beds.) Applications are invited for post of HOUSE OFFICER (medical, pre-registration). Salary £486 4s.–£600 12s. p.a., less £125 in respect of residential emoluments. Appointment to commence 8th August, 1960.

Applications, stating age, nationality, qualifications, and experience, with copies of 2 recent testimonials or names of 2 referees, to Hospital Secretary.

**BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS** AND ESSEX GENERAL HOSPITAL. (341 Beds.) SENIOR HOUSE OFFICER (medical), Special Departments, required. Giving experience in general and chest medicine, dermatology, pædiatrics, and physical medicine, and involving care of approximately 65 Beds in all. Salary £852 6s. p.a. less £150 in respect of residential emoluments. Appointment to commence 18th August, 1960, for a period of 6 months in the first instance, which is renewable for a further 6 months.

Applications, stating qualifications, nationality, age and experience, with copies of testimonials or names of 2 referees, to Hospital Secretary.

**BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS** AND ESSEX GENERAL HOSPITAL. Locum REGISTRAR ANÆSTHETIST (resident) required immediately. Permanent post recognised for F.F.A. R.C.S. examination. 1 month in first instance and then week-by-week basis.

Applications to Hospital Secretary. Telephone Bishop's Stortford 963.

**BISHOP'S STORTFORD AND DISTRICT HOSPITAL,** Rye-street, BISHOP'S STORTFORD, HERTFORDSHIRE. (67 Beds. Surgical, medical, and maternity.) RESIDENT SENIOR HOUSE OFFICER (Male) required immediately. Duties mainly surgical. Salary £852 6s. p.a. less £150 in respect of residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, to Hospital Secretary, Herts and Essex General Hospital, Bishop's Stortford, Herts.

**BLACKBURN. QUEEN'S PARK HOSPITAL. (596 general** beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medicine) required immediately for Acute Medical Unit (approximately 60 Beds).

Applications, with names of 2 referees, to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

**BLACKBURN. QUEEN'S PARK HOSPITAL. Blackburn** AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required 13th August, 1960. Post recognised for pre-registration purposes.

Applications, giving names of 2 referees, to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

**BLACKBURN. ROYAL INFIRMARY. (262 acute beds.)** BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required 13th August, 1960. Post recognised for F.R.C.S.

Applications, giving names of 2 referees, to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

**BLACKPOOL AND FYLDE HOSPITAL MANAGEMENT** COMMITTEE. MANCHESTER REGIONAL HOSPITAL BOARD. Psychiatry. Applications are invited for the post of REGISTRAR to the Psychiatric Department of the above hospital group. The inpatient unit (44 Beds) is at Wesham Park Hospital and outpatient clinics are held at the Victoria Hospital, Blackpool. In this unit the emphasis is on social psychiatry and experience of, or interest in, group methods of treatment would be considered an advantage. Facilities will be afforded for attending the D.P.M. course in Manchester. The post can be either resident or non-resident, and a flat is available for married applicants.

Applications, stating age, qualifications, experience, and giving the names and addresses of 2 referees, should be sent to the Group Secretary, Victoria Hospital, Blackpool.

**BLACKPOOL VICTORIA HOSPITAL. Senior House** OFFICER (E.N.T.). This post, now vacant, is recognised for the D.L.O. and F.R.C.S.

Applications, stating age, experience, and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

**BLACKPOOL VICTORIA HOSPITAL. (354 Beds.)** SENIOR HOUSE OFFICER (anæsthetics). This is a busy acute general hospital with a Regional Thoracic Surgical Unit, and the post, 1 vacancy arises in July and another vacancy on 1st September, is recognised for F.F.A. R.C.S. and D.A. At Junior level the staff consists of a Junior Hospital Medical Officer, a Registrar and 2 Senior House Officers. The post offers sound practical experience in anæsthesia with reasonable off-duty and regular postgraduate lectures.

Applications, stating age, qualifications, experience, and giving the names and addresses of 2 referees, should be sent to the Hospital Secretary.

**BLACKPOOL VICTORIA HOSPITAL. House Surgeons.** 2 pre-registration posts recognised for the F.R.C.S. are available in this busy modern hospital from 18th July and 1st August respectively.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Hospital Secretary.

**BOLTON AND DISTRICT GROUP OF HOSPITALS.** MANCHESTER REGIONAL HOSPITAL BOARD. RESIDENT REGISTRAR in Anæsthetics for the above Group, with main duties at the Bolton Royal Infirmary and the Bolton District General Hospital. Post recognised for the D.A. and F.F.A. R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

**BOLTON AND DISTRICT HOSPITAL MANAGEMENT** COMMITTEE.

RESIDENT SENIOR HOUSE OFFICER for the Geriatric Department of the Group. Vacant 16th August and tenable for 12 months.

**Bolton District General Hospital** (605 Beds)

RESIDENT SENIOR HOUSE OFFICER in Medicine. Vacant 16th August and tenable for 12 months.

RESIDENT HOUSE PHYSICIANS (2). Vacant 23rd July and 7th August. Tenable for 6 months and recognised under pre-registration service scheme.

**The Royal Infirmary, Bolton** (246 Beds)

RESIDENT HOUSE SURGEON. Vacant 1st August. Tenable for 6 months and recognised under pre-registration service scheme. Also recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

**BOURNEMOUTH AND EAST DORSET HOSPITAL** MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration) required 17th July, 1960, for Poole General Hospital and Parkstone Unit.

Applications, with copies of 2 testimonials, to the Hospital Secretary, Poole General Hospital, Poole, Dorset.

**BOURNEMOUTH AND EAST DORSET HOSPITAL** MANAGEMENT COMMITTEE. Locum GROUP REGISTRAR in Orthopædics required 18th–29th July, 1960, inclusive.

Applications to the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Shelley-road, Boscombe, Bournemouth.

**BOURNEMOUTH. ROYAL VICTORIA HOSPITAL,** Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (casualty and orthopædics), vacant beginning of July. Resident or non-resident. The Unit now consists of 3 Senior House Officers and a Registrar, with additional clinical assistant cover in the summer months. The appointment is recognised for the F.R.C.S. examination.

Applications to the Hospital Secretary.

**BRIGHTON AND LEWES HOSPITAL MANAGEMENT** COMMITTEE GROUP HOSPITALS. (76 Beds.) HOUSE SURGEON (Senior House Officer grade), 1 of 2, required end June in the E.N.T. Department of the above Hospitals. Recognised for D.L.O.

Applications, with details of experience, &c., together with names of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

**BRIGHTON GENERAL HOSPITAL. Applications are** invited for the appointment of SENIOR HOUSE OFFICER (orthopædics). Recognised for F.R.C.S. examinations. Vacant 22nd August, 1960.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Brighton.

**BRIGHTON GENERAL HOSPITAL. Applications are** invited for the appointment of HOUSE PHYSICIAN to the Medical Unit. This is a pre-registration appointment. Vacant 1st August, 1960.

Applications, enclosing recent testimonials, stating age, qualifications, experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton.

**BRIGHTON GENERAL HOSPITAL. Applications are** invited for the appointment of HOUSE SURGEON (recognised for F.R.C.S.) to the General Surgical Unit (60 Beds). Post vacant on 4th August, 1960. Recognised as a pre-registration appointment.

Applications, stating age, qualifications, experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Brighton.

**BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL.** (312 Beds.) SENIOR HOUSE OFFICER required for the Casualty and Orthopædic Departments with medical staff of 1 Junior Hospital Medical Officer, 1 Senior House Officer and 2 pre-registration House Surgeons. Duties include charge of orthopædic and traumatic beds.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

**BRISTOL. COSSHAM AND FRENCHAY HOSPITAL** MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Pathology required 1st August, 1960, at Frenchay Hospital (494 Beds). General medicine, general surgery and South Western Regional departments of neurosurgery, plastic surgery and thoracic surgery. Post resident (unmarried accommodation only) but applications to live out when not on duty will be considered. Provides training in all branches of clinical pathology. Laboratory recognised for Diploma in Pathology. Some duties in connection with the Regional Blood Transfusion Service.

Detailed applications, naming 2 referees, to the Group Secretary, Frenchay Hospital, Bristol, by 29th June, 1960.

**BRISTOL. COSSHAM AND FRENCHAY HOSPITAL** MANAGEMENT COMMITTEE. Applications invited for appointment of RESIDENT ANÆSTHETIST at Frenchay Hospital (494 Beds). Appointment will be made in either House Officer or Senior House Officer grade according to successful candidate's qualifications and experience. Position offers experience in general, neuro, plastic and thoracic surgery. Vacant 1st September, 1960, tenable initially for 1 year. Unmarried accommodation only.

Applications, naming 2 referees, to the Group Secretary, Frenchay Hospital, Bristol, by 7th July, 1960.

**BROMSGROVE, WORCESTERSHIRE. BARNSLEY** HALL HOSPITAL (for Mental Disorders). (750 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. Excellent opportunities for a young man to study, in a modern mental hospital, modern treatments and up-to-date psychiatry. House available. Remuneration will be in accordance with the terms and conditions of service issued by the Ministry of Health.

Applications, stating age and experience, together with the names of 3 referees, to the Medical Superintendent.

**BURTON-ON-TRENT GENERAL HOSPITAL. Locum** ANÆSTHETIST (resident) required for at least 6 weeks.

Applications to S. D. EVANS, Group Secretary, General Hospital, Burton-on-Trent.

**BURY, LANCASHIRE. FAIRFIELD GENERAL HOSPITAL.** Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), which falls vacant mid-July. The post is recognised for D.Obst.R.C.O.G.

Applications, giving details of experience and names of 2 referees, to Group Secretary, Bury and Rossendale Hospital Management Committee, Bury General Hospital, Bury, Lancs.

**CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS.** ADDENBROOKE'S HOSPITAL. REGISTRAR in Radiology (diagnostic) (temporary and non-resident) required for 1 year only from 1st October, 1960.

Apply, with full particulars, and names of 3 referees, to Secretary by 9th July, 1960.

**CANTERBURY. KENT AND CANTERBURY HOSPITAL.** (277 Beds.) Ear, Nose and Throat, and Eye Departments. SENIOR HOUSE OFFICER. National Health Service salary and conditions. Post vacant now. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

**CANTERBURY. KENT AND CANTERBURY HOSPITAL.** (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S., is vacant now. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

**CANTERBURY. KENT AND CANTERBURY HOSPITAL.** (277 Beds.) The post of Locum ANÆSTHETIST vacant 7th–26th August, 1960. Senior House Officer grading with National Health Service conditions. Post recognised for the D.A. and F.F.A. R.C.S.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary.

**CARLUKE. LAW HOSPITAL. (750 Beds.) Applications** are invited for the following posts :—

(1) SENIOR HOUSE OFFICER (medical).
(2) ORTHOPÆDIC HOUSE OFFICER (pre- or post-registration).

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, to be submitted to the Group Medical Superintendent, Law Hospital, Carluke.

**CARDIFF. LANSDOWNE HOSPITAL. (170 Beds.)** SENIOR HOUSE OFFICER required at above Hospital. Hospital serves wide area ; centre for tuberculous meningitis and respiratory poliomyelitis. Medical beds. Facilities for postgraduate study.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

**CARDIFF. ROOKWOOD HOSPITAL, Llandaff, Cardiff.** (236 Beds, some surgical and medical.) SENIOR HOUSE OFFICER (may be non-resident) required at above Hospital. Duties mainly surgical.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

**CARDIFF. ST. DAVID'S HOSPITAL. (521 Beds.) Senior** HOUSE OFFICER required in Casualty Department. National Health Service salary and conditions.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

**CARDIFF. THE UNITED CARDIFF HOSPITALS.** Applications are invited for the appointments of 2 SENIOR HOUSE OFFICERS in the Casualty/Orthopædic and Fracture Departments at the Cardiff Royal Infirmary, 1 to commence 1st August and 1 1st September. The successful applicants will spend 8 months in the Casualty Department and 4 months in the Orthopædic/Fracture Departments.

Application forms are available from the Secretary to the Board, Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

**CARLISLE. CUMBERLAND INFIRMARY and CITY** GENERAL HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE OFFICER (general medicine) for the 12-month period commencing 1st August, 1960.

Apply, giving 2 names for reference, to the Group Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

**CARSHALTON, SURREY. ST. HELIER HOSPITAL.** (763 Beds.) HOUSE PHYSICIAN (post approved for pre-registration service). Post vacant 11th July.

Applications, stating age, experience, and qualifications, with copies of recent testimonials or the names and addresses of 2 referees, should be sent to the Secretary.

**CARSHALTON, SURREY. ST. HELIER HOSPITAL.** (763 Beds.) HOUSE SURGEON (approved for pre-registration service). General surgery with duties in E.N.T. Post vacant 10th July.

Applications, giving age, qualifications, &c., with copies of recent testimonials or the names and addresses of 2 referees, should be sent to the Secretary at above address.

**CARSHALTON. ST. HELIER GROUP HOSPITAL** MANAGEMENT COMMITTEE. REGISTRAR for Department of Pathology. Duties mainly in Hæmatology Department but opportunities will be provided for work in other departments. Laboratory is recognised for the D.Path. The post is non-resident.

Application forms, to be returned by 16th July, obtainable from Group Secretary, St. Helier Hospital, Carshalton, Surrey.

**CHELMSFORD HOSPITAL MANAGEMENT COM-**MITTEE. Locum RESIDENT SURGICAL REGISTRAR required for the period 5th July–6th September inclusive.

Applications to Group Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

**CHELTENHAM GROUP HOSPITAL MANAGEMENT** COMMITTEE. Applications are invited from Male and Female practitioners for the additional appointment of SECOND SENIOR HOUSE OFFICER ANÆSTHETIST. Opportunities for study. Salary and conditions of service in accordance with Whitley Council regulations.

Applications, with names of referees and full details, to S. T. DAVIS, Group Secretary, General Hospital, Cheltenham.

**CHERTSEY, SURREY. ST. PETER'S HOSPITAL.** (415 Beds.) ANÆSTHETIC REGISTRAR required for duties mainly at St. Peter's Hospital with occasional duties in the Group. Post recognised for F.F.A. R.C.S. and D.A. Hospital may be visited by arrangement with Physician-Superintendent (telephone Ottershaw 441).

Application forms from Secretary, Woking and Chertsey Hospital Management Committee, Huntington, Guildford-road, Chertsey, Surrey. Closing date 6th July.

**COLCHESTER GROUP HOSPITAL MANAGEMENT** COMMITTEE. Applications invited for :—

**Essex County Hospital, Colchester, Essex** (178 Beds)

Post of SENIOR HOUSE OFFICER to Casualty and Radiotherapy Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Post of Locum REGISTRAR (casualty and orthopædic) for period of several weeks commencing immediately.

**Black Notley Hospital, Braintree, Essex** (522 Beds)

Post of HOUSE SURGEON. Pre-registration or third post. Includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Tenable for 6 months. House available for rent in close proximity to the Hospital.

Post of SENIOR HOUSE OFFICER for Non-Pulmonary Tuberculosis Unit of approximately 120 Beds, particularly for skeletal and renal tuberculosis ; also rheumatoid arthritis cases and spastic children. Recognised for F.R.C.S. House available for rent in close proximity to the Hospital.

Post of HOUSE PHYSICIAN. Pre-registration or third post. Includes duties in medical and pædiatric wards. House available for rent in close proximity to the Hospital.

**St. Mary's Hospital, Colchester, Essex** (171 Beds)

Post of SENIOR HOUSE OFFICER. The post involves work principally in the departments of general and special surgery, with limited additional duty in the Radiotherapy Department and the Colchester Chest Clinic.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

**CHICHESTER. ROYAL WEST SUSSEX HOSPITAL.** (202 Beds.) SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer). Appointment mainly for casualty duty. Recognised for F.R.C.S. 8 house staff. Salary £852 6s. p.a. less residential charge. Vacant now.

Apply, stating age, experience, qualifications with references or names of referees, to Hospital Secretary.

**CHICHESTER GROUP HOSPITAL MANAGEMENT** COMMITTEE. Applications are invited for the appointment of SURGICAL REGISTRAR (Resident Surgical Officer) for 1 year (renewable) from mid-September for duty primarily at Royal West Sussex Hospital, Chichester (202 Beds). Post recognised for F.R.C.S. 8 residents (4 surgical), of whom Resident Surgical Officer is the senior. Salary £972 8s. first year, £1103 19s. second, each less £170 for residence. Candidates may visit hospital.

Forms from Group Secretary, 174, Broyle-road, Chichester, Sussex.

**CHICHESTER GROUP HOSPITAL MANAGEMENT** COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT SURGICAL REGISTRAR required for duty primarily at St. Richard's Hospital (400 Beds) on 22nd August for 1 year in first instance Hospital recognised for F.R.C.S. Whitley Council terms and National Health Service superannuation. Salary £972 8s. first year, £1103 19s. second year, less £170 for residence. Candidates may visit Hospital.

Forms from, and returnable within 14 days to, Group Secretary, 174, Broyle-road, Chichester.

**COVENTRY. GULSON HOSPITAL. (312 Beds.) Senior** HOUSE OFFICER in General Medicine. Vacant 1st July. Resident.

Applications to Hospital Secretary.

**COVENTRY. GULSON HOSPITAL. (312 Beds.) House** PHYSICIAN (2 posts). Vacant 14th and 23rd July. Pre-registration.

Applications to Hospital Secretary.

**COVENTRY. GULSON HOSPITAL. (312 Beds.) House** SURGEON. Vacant 24th July. Recognised F.R.C.S. Pre-registration. Resident.

Applications to Hospital Secretary.

**COVENTRY AND WARWICKSHIRE HOSPITAL, Coven-**TRY. (418 Beds.) HOUSE OFFICER in General Medicine. Vacant 6th July. Pre-registration.

Applications to Hospital Secretary.

**CREWE AND DISTRICT MEMORIAL HOSPITAL. (143** Beds.) SURGICAL HOUSE OFFICER required (recognised pre-registration post). Approved for F.R.C.S.

Applications, stating age, qualifications, &c., with names of 2 referees, to be sent to the Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

**CROMER AND DISTRICT HOSPITAL requires Senior** HOUSE OFFICER (resident). Post vacant 1st August, 1960. Tenable for 6 months or 1 year. This is 1 of 2 House Officer posts offering a unique range of experience. The 2 House Officers at the hospital work for alternating periods of 3 months under the Physician and Surgeon respectively. They visit and assist at an active treatment unit for rheumatism and a children's hospital while working with the Physician, and at an active treatment geriatric unit while working with the Surgeon. Travelling allowance is paid to car owners or hospital transport provided. The hospital is a busy one of 52 Beds holding out-patient clinics in all major specialties at which the House Officers attend. It is unusually well equipped. The posts are resident with all services if desired, but for married applicants there is a self-contained modern furnished flat of quite superior standard. The dual nature of the post ensures regular off-duty.

Applications, giving details of qualifications and experience, together with the names of 2 referees, should be forwarded to the Secretary, Cromer and District General Hospital, Cromer, Norfolk.

**DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL.** Applications are invited for the post of SENIOR HOUSE OFFICER (general medicine and dermatology) which falls vacant on 1st August, 1960.

Detailed applications, with the names of 2 referees, to be sent to the Administrative Officer at the Hospital.

**DONCASTER HOSPITAL MANAGEMENT COMMIT-**TEE. HOUSE PHYSICIAN (Senior House Officer) required between Western Hospital, Doncaster, and Doncaster Royal Infirmary. Resident at Western Hospital.

Applications, with particulars of experience and copies of 2 recent testimonials, to the Group Secretary at Doncaster Royal Infirmary.

**DONCASTER ROYAL INFIRMARY. Applications are** invited for the post of SENIOR HOUSE OFFICER in Ophthalmology. Recognised for D.O. Post vacant early August.

Applications, with particulars of experience and copies of 2 recent testimonials, to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

**DONCASTER. ST. CATHERINE'S HOSPITAL. Appli-**cations are invited from registered medical practitioners for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry. St. Catherine's is a modern mental deficiency hospital of some 500 Beds on the outskirts of Doncaster. Residential accommodation could be provided in the event of a woman being appointed. A man could be appointed only in a non-resident capacity.

Applications, stating age, qualifications and experience, together with names of 3 referees, should be forwarded to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary by 10th July.

**DORCHESTER. DORSET COUNTY HOSPITAL. (109** Beds.) CASUALTY OFFICER (Senior House Officer grade) required from early July for approximately 2 months.

Applications, stating age qualifications, nationality and experience, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, immediately.

**DERBY CITY HOSPITAL. (260 Beds. 12 Residents.)** (Obstetric Department 66 Beds ; Queen Mary Maternity Home Annexe 36 Beds.) DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. OBSTETRICAL HOUSE SURGEON (pre-registration/Senior House Officer). Recognised for D.Obst.R.C.O.G. if held by Senior House Officer. Post vacant 7th August, 1960.

Applications, with 2 references, should be forwarded to the Medical Superintendent, City Hospital, Derby.

**DERBY. DERBYSHIRE ROYAL INFIRMARY. (416** Beds.) HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER (general surgery). Vacant end of June. Recognised F.R.C.S. if held by Senior House Officer.

Apply, stating full details, and 2 names for reference, to Secretary.

**DERBY. DERBYSHIRE ROYAL INFIRMARY.** Senior HOUSE OFFICER (anæsthetics) now vacant. Recognised for D.A.

Write, stating full details, and 2 names for reference, to Secretary.

**EAST KILBRIDE, LANARKSHIRE. HAIRMYRES** HOSPITAL. (714 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for work in the tuberculosis wards and thoracic surgical unit.

Applications, stating age, nationality, qualifications and experience, with names of 2 referees, to Physician-Superintendent.

**EDGWARE GENERAL HOSPITAL, Edgware, Middlesex.** SENIOR HOUSE SURGEON, resident, required for E.N.T. Department at Colindale and Edgware General Hospitals. Post recognised for F.R.C.S. and D.L.O. purposes.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 2nd July, 1960.

**EDGWARE GENERAL HOSPITAL, Edgware, Middlesex.** RESIDENT HOUSE SURGEON. Post vacant 30th July, 1960. Recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications and experience, and enclosing up to 3 recent testimonials, to Medical Administrator of Hospital by 1st July, 1960.

**EXETER. ROYAL DEVON AND EXETER HOSPITAL.** EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics). Resident or non-resident. Vacant now. The post is recognised for the F.F.A. R.C.S. examination.

Apply, with copies of 2 recent testimonials, to the Hospital Secretary.

**FARNBOROUGH HOSPITAL. Locum Senior House** OFFICER in Anæsthetics required 4th July for approximately 2 months.

Applications, giving full details, to Secretary, Bromley Group Hospital Management Committee, Farnborough Hospital.

**GLASGOW ROYAL MENTAL HOSPITAL. Applications** are invited from suitably qualified persons for the post of REGISTRAR in Psychiatry. The post offers wide experience and training in all aspects of psychiatry, and all modern methods of treatment are carried out.

Applications, with the names of 2 referees, to be sent as soon as possible to the Physician-Superintendent, Glasgow Royal Mental Hospital, 1055, Great Western-road, Glasgow, W.2.

**GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL.** SENIOR HOUSE OFFICER in Medicine for Acute Medical Teaching Unit (80 Beds).

Write immediately to Secretary, Board of Management for Glasgow South-Western Hospitals, 1301, Govan-road, Glasgow, S.W.1, naming 2 referees.

**GLASGOW WESTERN HOSPITALS BOARD OF MAN-**AGEMENT. Applications are invited for the appointment, which will be for 1 year in the first instance, of REGISTRAR in Ophthalmology based at the Western Infirmary, Glasgow.

Applications (single copy only), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Board of Management for Glasgow Western Hospitals, 10, Park Circus, Glasgow, C.3, by 6th July, 1960.

**GLASGOW WESTERN HOSPITALS BOARD OF MAN-**AGEMENT. Applications are invited for the appointment, which will be for 1 year in the first instance, of REGISTRAR in E.N.T. Surgery at the Western Infirmary, Glasgow.

Applications (single copy only), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Board of Management for Glasgow Western Hospitals, 10, Park Circus, Glasgow, C.3, by 9th July, 1960.

**GRIMSBY GENERAL HOSPITAL. (197 Beds.) Sheffield** REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT MEDICAL REGISTRAR required. Duties also at Scartho Road Hospital. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 4th July, 1960, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

**HASTINGS GROUP HOSPITAL MANAGEMENT COM-**MITTEE. Locum ORTHOPÆDIC REGISTRAR required immediately for whole-time duties in the Hastings Group. Non-resident. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff.

Applications, giving particulars of age, qualifications and experience, together with the names and addresses of 2 referees, to be sent to the Secretary, Hospital Management Committee, 9, White Rock-road, Hastings.

**HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (146** Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON for General and E.N.T. Surgery. The Hospital is the main surgical unit in the Group with a resident staff of 4. The post is recognised for the F.R.C.S., for which it offers excellent experience. The appointment is for 6 months and is vacant now.

Applications, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, or the names of 2 referees, should be submitted to the Hospital Administrator.

**HASTINGS. ROYAL EAST SUSSEX HOSPITAL.** HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE OFFICER for General and E.N.T. Surgery required immediately. The Hospital is the main surgical unit in the Group with a resident staff of 4. The post is recognised for the F.R.C.S., for which it offers excellent experience.

Applications, with full details and with copies of 3 recent testimonials or the names of 2 referees, should be submitted to the Hospital Administrator, Royal East Sussex Hospital, Cambridge-road, Hastings.

**HASTINGS. ST. HELEN'S HOSPITAL. (491 Beds.)** Applications are invited for the post of Pre-registration HOUSE PHYSICIAN at this Hospital which is the main medical centre of the Group with a resident staff of 5, and offers a wide experience in general medicine. The appointment is for 6 months and falls vacant 4th July, 1960.

Applications, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, or the names of 2 referees, should be submitted to the Hospital Administrator.

**HAILSHAM (near Eastbourne), SUSSEX. HELLINGLY** HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICERS and SENIOR HOUSE OFFICER (Male or Female) required at Hellingly Hospital and its associated new unit, Amberstone Hospital. There are 3 vacancies. The Hospitals serve a very large area, have a high admission-rate and staff 5 active out-patient clinics in general hospitals. Facilities are available for experience in all aspects of adult psychiatry, in which teaching is given by the senior staff. Regular teaching in neurology, psychology and psychotherapy is also available. The Hospital is recognised for D.P.M., study for which is actively encouraged. Attractive furnished flats, suitable for married or unmarried doctors, are available.

Applications, giving full particulars and including the names of at least 2 persons to whom reference can be made, should be sent to the Medical Superintendent, Hellingly Hospital.

**HALIFAX GENERAL HOSPITAL. Senior House Officer** in General Surgery required. Post vacant 1st July, 1960. Salary £852 6s. p.a., with deduction of £150 p.a. for board-residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

**HAREFIELD HOSPITAL, Harefield, Middlesex. North** WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR in Chest Medicine required at above Hospital to work on wards for the treatment of tuberculosis in all its forms and for the treatment of non-tuberculous respiratory diseases. Candidates will be required to have had a wide experience in general medicine. The Hospital has 311 Beds for tuberculosis, 60 for non-tuberculous respiratory diseases, 90 Beds for thoracic surgery, 100 Beds for general medicine and general surgery. The appointment affords ample opportunity for candidates working for higher medical degrees.

Application forms obtainable from and returnable by 11th July, 1960, to the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex.

**HAROLD WOOD HOSPITAL, Essex. Applications invited** for REGISTRAR in Clinical Pathology in the Area Laboratory for 6 months in first instance from July. All branches of clinical pathology undertaken.

Please apply to Group Secretary, Brentwood Hospital Management Committee, High Wood Hospital, Brentwood, Essex.

**HEXHAM GENERAL HOSPITAL, Northumberland.** (304 Beds.) Applications are invited for the following House appointments, vacant 7th July, 1960. Pre- or post-registration vacancies.

HOUSE SURGEON (general).
HOUSE SURGEON (orthopædic).
CASUALTY OFFICER.

Applications will be considered from final-year students in anticipation of graduation and also from registered practitioners. Registered practitioners may be appointed on the Senior House Officer grade depending on experience whilst the Casualty Officer could be appointed to the Junior Hospital Medical Officer grade. Hospital recognised by Royal College of Surgeons. Large orthopædic unit providing excellent experience.

Applications, with names of 2 referees, to Group Secretary, General Hospital, Hexham, Northumberland.

**HILLINGDON HOSPITAL, Uxbridge, Middlesex.** (General, 621 Beds.) REGISTRAR in Obstetrics and Gynæcology for whole-time resident post, recognised for M.R.C.O.G. Candidates may visit hospital by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Uxbridge Group Hospital Management Committee, Group Office, Hillingdon Hospital, Hillingdon, Middlesex, by 5th July.

**HORNCHURCH, ESSEX. ST. GEORGE'S HOSPITAL.** Neurosis Centre. Temporary REGISTRAR in Psychological Medicine required immediately. Should be closely interested in social and group psychotherapy. Applicants may visit the Centre by arrangement with the Hospital Secretary (Hornchurch 43531) from whom further information can be obtained.

Applications, quoting Ref. 16/123, and names of 2 referees, to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch-road, Romford, Essex.

**HULL A GROUP HOSPITAL MANAGEMENT COM-**MITTEE. HOUSE PHYSICIAN, Pædiatric Unit. Duties at Victoria Hospital for Sick Children for 3 months followed by 3 months on the pædiatric wards, Western General Hospital. An interesting and varied post which includes outpatient and casualty work. This appointment, which commences on 1st August, 1960, is recognised for the D.C.H.

Apply, giving experience, testimonials, &c., to the Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

**HULL. VICTORIA HOSPITAL FOR SICK CHILDREN,** Park-street, HULL. 2 HOUSE SURGEONS required, 1 to commence duty on 25th July, 1960, and 1 to commence duty on 1st September, 1960. Junior or Senior House Officer grade, according to experience. These are interesting and varied posts which include outpatient clinics. Both these posts are for 6 months' duration and are recognised for D.C.H.

Applications, together with details of experience, testimonials, &c., should be sent to the Hospital Secretary.

**HEREFORD COUNTY HOSPITAL. (334 Beds.) 2 House** PHYSICIANS required. Pre-registration posts. Posts vacant 1st and 5th August.

Applications, with copies of 2 recent testimonials, to Medical Superintendent, County Hospital, Hereford.

**HEREFORD GENERAL HOSPITAL. (154 Beds.)** House PHYSICIAN required. Post vacant 12th July. Pre-registration post.

Applications, with copies of 2 recent testimonials, to Group Secretary, Victoria House, Eign-street, Hereford.

**HEMEL HEMPSTEAD. WEST HERTS HOSPITAL.** NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident or non-resident) required at above Hospital. Post recognised for F.F.A. R.C.S. Married accommodation available. Post vacant immediately.

Application form obtainable from and returnable to Secretary, West Herts Hospital, Hemel Hempstead, Herts, by not later than 2nd July, 1960.

**HOUNSLOW HOSPITAL, Staines-road, Hounslow,** MIDDLESEX. (General acute, 75 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN. Recognised pre-registration appointment for 6 months. Post vacant 9th July, 1960.

Applications, stating qualifications and age, together with copies of 3 recent testimonials or name for reference, to the Hospital Secretary.

**ILFORD, ESSEX. KING GEORGE HOSPITAL. There is** a vacancy for a CLINICAL ASSISTANT (E.N.T.) at above Hospital. 2 sessions per week—Monday and Wednesday mornings. Remuneration in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), i.e., £382 4s. p.a.

Applications, accompanied by testimonials, to be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary, Ilford and
Barking Group Hospital Management Committee.

**ILFORD. KING GEORGE HOSPITAL, Eastern-avenue,** ILFORD, ESSEX. (General hospital, 208 Beds.) There will be a vacancy for a SENIOR HOUSE OFFICER, Orthopædic Department, on 1st August, 1960. Salary will be at the rate of £852 6s. p.a., less emoluments. Recognised for the F.R.C.S.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary, Ilford and
Barking Group Hospital Management Committee.

**ILFORD MATERNITY HOSPITAL, Eastern-avenue,** ILFORD, ESSEX. There will be a vacancy for a SENIOR HOUSE OFFICER (obstetrics and also entails care of some gynæcological beds) at above Hospital on 1st August, 1960. Salary will be at the rate of £852 6s. p.a. less emoluments. This post is recognised for training for the D.Obst.R.C.O.G.

Applicants should have been registered not less than 1 year and should send applications, accompanied by copies of 3 testimonials, to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management
Committee, King George Hospital, Ilford.

**ILKLEY. MENSTON (Psychiatric) HOSPITAL, Menston,** ILKLEY, YORKSHIRE. Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER required immediately. Accommodation available for single person.

Applications, in writing, stating age, qualifications, experience, and names of 2 referees, to Physician-Superintendent.

**ILKLEY. MIDDLETON HOSPITAL. (346 Beds.) Resident** SENIOR HOUSE OFFICER required at above Hospital, mainly for duties on geriatric wards. Ample facilities for study.

Applications, stating age, nationality, qualifications and experience, together with names of 2 referees, to Group Secretary.

**ILKLEY. MIDDLETON HOSPITAL. (346 Beds.) Junior** HOSPITAL MEDICAL OFFICER required for general duties at above Hospital which caters for geriatrics, orthopædics, non-tuberculous chest diseases, gynæcology, and general surgery. Appointment is subject to terms and conditions of service of hospital medical staff and is limited to 3 years in the first instance. Residential accommodation for single applicants.

Applications, together with names of 2 referees, as soon as possible to Group Secretary.

**IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING).** (351 Beds.) HOUSE SURGEON required to the E.N.T. and Ophthalmic Departments. Recognised for pre-registration and for D.L.O. examinations. Excellent library facilities.

Applications, giving full particulars and copies of recent testimonials, to Hospital Secretary.

**IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING), IPSWICH.** (280 Beds.) Locum HOUSE SURGEON (pre-registration) to General Surgeons required.

Applications, giving details of qualifications, &c., to the Hospital Secretary.

**IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING), IPSWICH.** (280 Beds.) Applications are invited for post of HOUSE SURGEON (pre-registration) to General Surgeons.

Applications, giving details of qualifications, age, nationality, &c., together with copies of 3 recent testimonials, to the Hospital Secretary.

**ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. WESSEX REGIONAL HOSPITAL BOARD.** ANÆSTHETIC REGISTRAR, full-time, required for the Isle of Wight Group of hospitals. Non-resident post. Vacant 1st November.

Forms of application may be obtained from the Group Secretary, I.W. Group Hospital Management Committee, Clatterford House, Carisbrooke, Newport, I.W., and must be returned (in triplicate) not later than 30th June.

**JOHNSTONE. THORNHILL MATERNITY HOSPITAL.** Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident) in Obstetrics and Gynæcology. Applicants must be 1 year fully registered.

Applications, detailing previous experience, together with the names of 2 referees, should be submitted to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

**KENDAL. WESTMORLAND COUNTY HOSPITAL** (English Lake District.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical). 28 medical beds. Duties include care of acute cases under supervision of 2 Consultant Physicians and attendances at consultative clinics. Post offers good experience for candidate studying for higher qualifications.

Apply, stating age, qualifications, experience, and naming 2 medical referees, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

**KETTERING AND DISTRICT GENERAL HOSPITAL,** KETTERING. Applications are invited for the appointment of HOUSE OFFICER in E.N.T. Surgery. Post offers excellent experience in a busy department. Possibility of married quarters.

Applications, stating age, experience and qualifications, together with copies of 3 recent testimonials, to the Hospital Secretary at the above address.

**KINGSTON HOSPITAL, Kingtson upon Thames.** KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the posts of Pre-registration HOUSE OFFICER (general surgery, 2 posts) which are available on 1st August, 1960.

Applications, stating age, qualifications and experience, together with 2 recent testimonials, should reach the Physician-Superintendent of the Hospital as soon as possible.

**LEEDS REGIONAL HOSPITAL BOARD. Registrar** vacancies.

*Infectious Diseases*

Leeds Road Hospital, Bradford (120 infectious diseases beds). Accommodation for a single person only at the present time and married accommodation will be available at a later date.

*Orthopædic Surgery*

Harrogate General Hospital (total beds 253; orthopædic beds 31). A small detached furnished house is available for rental.

*Pædiatrics*

Victoria Hospital for Sick Children, Hull, and other General Hospitals with pædiatric beds in the Hull A and East Riding Hospital Management Committee Groups (aggregate 150 Beds). Residential accommodation may be available. Vacant 1st July, 1960.

*Pathology*

Duties at hospitals in the Bradford A Group. (Duties which will be in all branches of pathology will be primarily at St. Luke's Hospital, Bradford.) The post offers opportunity for study for a higher qualification and is recognised for the Diploma in Pathology. Non-resident.

*Psychiatry*

The Board in association with the Department of Psychiatry of the University of Leeds wishes to encourage applications for the under-mentioned posts from doctors suitable for training in psychiatry who wish to take the D.P.M. course, full particulars of which can be obtained from the Sub-Dean, The Medical School, Thoresby-place, Leeds, 2 :—

(*a*) Meanwood Park Hospital (Mental Deficiency), Leeds (800 Beds). Accommodation for married person with no children and single accommodation also available.

(*b*) Stanley Royd Hospital, Wakefield (approximately 2000 Beds). Married and single accommodation available.

(*c*) Storthes Hall Hospital, Huddersfield (2750 Beds). Resident, married and single accommodation available.

Candidates may visit the hospitals by direct arrangement with the Physician-Superintendents thereof, who will be pleased to supply further information.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 5th July, 1960.

**LEEDS REGIONAL HOSPITAL BOARD. Senior Regis-**TRAR in Psychiatry for duties initially at Naburn and Bootham Park Hospital, York (629 Beds). In addition to inpatient treatment, these Hospitals jointly with the Health Department of the City of York provide a combined Mental Health Service for the City to undertake the domiciliary care and resettlement of psychiatric patients. Opportunity also exists for work in association with the Department of Psychiatry, University of Leeds. This post is included in a scheme which is designed to provide maximum facilities for advanced study and training and the person appointed may, if he so wishes, be seconded at a later date to another hospital within the Region in order to gain further experience. At present there is accommodation at this Hospital for single persons only. Candidates for this appointment must hold the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments (with dates), together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 30th June, 1960.

**LEICESTER. TOWERS MENTAL HOSPITAL. (1024** Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. Salary £886 12s.–£57 4s.–£1229 16s. p.a. The Hospital is divided into 3 clinical teams. Each team has its own admission wards and outpatients under a Consultant Psychiatrist. Wide experience is therefore obtained in the diagnosis and treatment of all types of psychiatric cases both inpatient and outpatient. Clinical conferences are held weekly. Junior Staff are encouraged to study for the D.P.M., and in addition to courses at Sheffield University for which travelling expenses are allowed, tutorials are given by the Senior Staff. The Hospital is recognised for D.P.M. The area Electroencephalography Department is also sited at the Towers Hospital. Resident accommodation is available for a single man or woman, and a newly furnished flat for married persons or, alternatively, an unfurnished flat.

Applications, giving details of age, experience, with the names of 2 persons to whom reference may be made, should be forwarded to the Medical Superintendent as soon as possible.

**LEICESTER ISOLATION HOSPITAL AND CHEST** UNIT, Groby-road, LEICESTER. (328 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (surgical) (post recognised for Final Fellowship), vacant 1st July, 1960. Salary £852 6s. p.a. The appointment is tenable for 6 months, and may be extended for a further period of 6 months. Experience will be gained in all branches of thoracic surgery, including cardiac surgery.

Applications, giving age, qualifications, dates, &c., and copies of 2 recent testimonials, to be forwarded as soon as possible to the Department of Thoracic Surgery at the above Hospital.

**LENNOXTOWN. LENNOX CASTLE MATERNITY** HOSPITAL, STIRLINGSHIRE. REGISTRAR and a SENIOR HOUSE OFFICER required. Salaries in accordance with recognised scales and appointments subject to National Health Service (Superannuation) Regulations 1950.

Applications (2 copies), stating age, sex, nationality, qualifications and experience, and present appointment, together with names and addresses of 3 referees, to be submitted within 14 days to the Secretary, Board of Management, Lennox Castle, 113, Douglas-street, Glasgow, C.2.

**LIVERPOOL. MOSS SIDE HOSPITAL, Maghull, Liverpool.** (500 Beds, for mental defectives exhibiting conduct disorders.) JUNIOR HOSPITAL MEDICAL OFFICER or REGISTRAR. Excellent opportunities for study, treatment, and training of behaviour disorders of all kinds and degrees. Hospital recognised for D.P.M. training. Facilities for study at Liverpool University. Modern house available, or alternative if single. Candidates may visit Hospital by appointment.

Applications, naming 3 referees, to Medical Superintendent by 8th July, 1960.

**LIVERPOOL. SOUTH LIVERPOOL HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited from suitably qualified medical practitioners for the following Senior House Officer appointments :—

**Sefton General Hospital, Liverpool, 15** (995 Beds)
2 SENIOR HOUSE OFFICERS (medical).
1 SENIOR HOUSE OFFICER (psychiatric).
1 SENIOR HOUSE OFFICER (casualty).
1 SENIOR HOUSE OFFICER (anæsthetic).

**Mossley Hall Hospital, Park-avenue, Liverpool, 18** (152 Beds)
1 SENIOR HOUSE OFFICER (medical).
1 SENIOR HOUSE OFFICER (surgical).

The appointments will be for a period of 12 months with effect from 1st October, 1960, except in the case of the casualty post, which will be from 1st September, 1960.

Application forms may be obtained from the undersigned, to whom they should be returned to be received not later than first post on Wednesday, 20th July, 1960.

GARNET CHAPLIN, Secretary to the Committee.

Sefton General Hospital, Liverpool, 15.

**LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS.** Applications are invited for the post of Locum REGISTRAR in Medicine for the period to 30th June, 1961.

Apply by 9th July, 1960, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

**LIVERPOOL, 9. WALTON HOSPITAL. (1285 Beds.)**

SENIOR HOUSE OFFICER in Obstetrics and Gynæcology. Recognised for Diploma and M.R.C.O.G. Vacant from 1st September, 1960.

HOUSE PHYSICIANS, HOUSE SURGEONS. Posts recognised for pre-registration service. Vacant from 1st September, 1960.

HOUSE SURGEON in Orthopædics. Post recognised for pre-registration service.

SENIOR HOUSE OFFICER in Orthopædics. Post recognised for F.R.C.S.

SENIOR HOUSE OFFICER in Neurosurgery in the Liverpool Regional Neurosurgical Unit at Walton Hospital. Post recognised for F.R.C.S.

Apply to Physician-Superintendent, giving details of age, qualifications, and experience, and names of 2 referees.

**LIVERPOOL, 22. WATERLOO HOSPITAL. A Locum** MEDICAL OFFICER (Junior Hospital Medical Officer grade) is required, mainly for surgical duties, for a period of 3 weeks from 9th July.

Apply to Secretary, Walton Hospital, Liverpool, 9.

**LLANELLY HOSPITAL, Llanelly. (160 Beds.) Glantawe** HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Casualty Department of the above Hospital.

Applications, stating age and particulars of experience, together with copies of 2 recent testimonials, should be sent to the Hospital Secretary. T. E. JONES, Group Secretary.

**LLWYNYPIA HOSPITAL, Llwynypia, Rhondda. (203** Beds—recently modernised acute hospital with large Outpatient Department. Recognised for F.R.C.S.) SENIOR HOUSE OFFICER (surgery) required.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent, as soon as possible, to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

**LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215** Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (obstetrics and gynæcology) which becomes vacant 4th August, 1960, at this busy General Hospital.

Applications, giving age, qualifications and experience, together with the names of 2 referees, should be addressed to the Hospital Secretary.

**LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire.** Locum ANÆSTHETIC REGISTRARS (resident or non-resident) required immediately.

Applications to the Secretary.

**MACCLESFIELD. PARKSIDE HOSPITAL.** Neurosurgical Unit. SENIOR HOUSE OFFICER. Applications are invited from fully registered practitioners for this post at the above 14-Bed unit. The post will be for tenure of 1 year in the first place and the unit is run in conjunction with the Consultant Staff of the Neurosurgical Unit of the Manchester Royal Infirmary and the University Department of Neurosurgery. Accommodation available for single person.

Apply to Medical Superintendent, Parkside Hospital, by 2nd July, 1960.

**MAIDSTONE. WEST KENT GENERAL HOSPITAL.** (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £852 6s. a year less £150 a year for board and lodging. Post vacant 8th August, 1960.

Applications to the Administrative Officer at the Hospital.

**MAIDSTONE. WEST KENT GENERAL HOSPITAL.** (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN. 6-month appointment. Post vacant 4th August, 1960.

Applications to the Administrative Officer at the Hospital.

**MAIDSTONE. WEST KENT GENERAL HOSPITAL.** (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6-month appointment. Post vacant 21st August, 1960. Recognised for F.R.C.S.

Applications, stating age and experience, to the Administrative Officer.

**MAIDSTONE. WEST KENT GENERAL HOSPITAL.** (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE SURGEON. Recognised for F.R.C.S. Salary £852 6s. a year less £150 for residential emoluments. Post vacant 27th August, 1960.

Applications as soon as possible to the Administrative Officer at the Hospital.

**MANCHESTER, 19. DUCHESS OF YORK HOSPITAL** FOR BABIES. (103 Beds.) SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER, pre- or post-registration, required for 6 months, commencing 1st July. This Hospital offers experience in all acute medical and surgical conditions in children up to the age of 5 years. There is a premature baby unit, a large cerebral palsy clinic, and the Hospital is the main regional centre for plastic surgery in young children. In association with the University Department of Child Health, undergraduate teaching is conducted throughout the year.

Applications, with copies of 3 testimonials, to be sent to the Hospital Secretary as soon as possible.

**MANCHESTER REGIONAL HOSPITAL BOARD invite** applications for the post of REGISTRAR in Anæsthetics with the Stockport and Buxton Hospital Management Committee, vacant 22nd August, 1960. The post may be non-resident or resident, and married quarters can be provided if required. The post is recognised for the D.A. and F.F.A.R.C.S. and would suit a candidate wishing to study for higher qualification.

Applications, with full particulars, and the names of 2 referees, to be forwarded to the undersigned.

E. J. DURRANT, Group Secretary.

59B, Shaw Heath, Stockport.

**MANCHESTER. UNITED MANCHESTER HOSPITALS.** SAINT MARY'S HOSPITALS, MANCHESTER. A REGISTRAR in Obstetrics and Gynæcology is required immediately. Initially the appointment will be for 1 year, renewable normally for a second year. Non-resident. Duties include considerable clinical responsibility and "Flying Squad" service, supervision of House Officers and some teaching of undergraduate medical students. Higher qualification desirable.

Forms of application may be obtained from the undersigned and returned by 4th July, 1960.

A. R. J. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

**MANCHESTER. UNITED MANCHESTER HOSPITALS.** SAINT MARY'S HOSPITALS, MANCHESTER. Applications invited from registered medical practitioners, Male or Female, for 2 posts of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for 6 months, vacant 1st August and 1st September. Previous hospital experience essential and pædiatric experience desirable. Duties include care of the newborn in the maternity department, care of infants in infants' ward and work in clinics under the charge of the Department of Child Health. A Unit for investigation of congenital heart disease has been established.

Applications, stating qualifications and experience, with the names of 3 referees, to the undersigned not later than 2nd July, 1960. A. R. J. WISE, General Superintendent.

Saint Mary's Hospital, Whitworth Park, Manchester, 13.

**MANCHESTER. UNITED MANCHESTER HOSPITALS.** Applications are invited for the post of REGISTRAR (non-resident) in Cardiology, jointly in the Diagnostic Unit in the Department of Child Health at St. Mary's Hospital and in the Department of Cardiology at the Manchester Royal Infirmary. Previous pædiatric experience is desirable. Facilities for work in general medicine or in pædiatrics are available according to the preference of the candidate appointed.

Application forms obtainable from A. B. SCOTT, Secretary to the Board of Governors, United Manchester Hospitals, The Lodge, Oxford-road, Manchester, 13, must be returned before 9th July, 1960.

**MANCHESTER, 23. WYTHENSHAWE HOSPITAL.** SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER (casualty) at the above Hospital becoming vacant on 15th July, 1960. This post is recognised by the Royal College of Surgeons.

Applications, with full details, and the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20, by 2nd July, 1960.

**MANCHESTER, 23. WYTHENSHAWE HOSPITAL,** SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens SENIOR HOUSE OFFICER in General Surgery required at the above Hospital on a week-to-week basis from mid-July, 1960.

Applications, with full details, should be sent to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

**MANCHESTER, 23. WYTHENSHAWE HOSPITAL.** SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Pathology, resident or non-resident, vacant 1st September, 1960. The post provides experience in all branches of pathology ; previous experience in this specialty is not essential.

Applications with full details, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, not later than 2nd July, 1960.

**MANCHESTER. SPRINGFIELD HOSPITAL, Crumpsall,** MANCHESTER, 8. SPRINGFIELD AND SWINTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment as REGISTRAR at this Psychiatric Hospital (790 Beds). Modern methods of investigation and treatment are in use. The admission-rate about 700 a year ; there are outpatient clinics at Hospital. Facilities for attendance at the course for the D.P.M. of the University of Manchester (with the Department of Psychiatry of which this Hospital is associated). Attendance at these lectures is not limited to those intending to take the Manchester examination. Previous experience in psychiatry is desirable but not essential. Accommodation is available for a single person; permission to live out may be granted. Terms and conditions of the National Health Service apply. Further particulars can be obtained from, and the Hospital may be visited by arrangement with, the Medical Superintendent.

Applications, giving details of age, experience, &c., together with the names of 3 referees, to be sent to the Medical Superintendent as soon as possible.

**MID GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the following medical posts which will fall vacant on 1st August, 1960 :—

**Neath General Hospital, Neath** (412 Beds)

HOUSE SURGEONS.
HOUSE PHYSICIANS.
HOUSE SURGEONS (obstetrics and gynæcology).

**Bridgend General Hospital, Quarella-road, Bridgend** (381 Beds)

HOUSE SURGEONS.
HOUSE PHYSICIANS.
HOUSE SURGEONS (obstetrics and gynæcology).

These hospitals are recognised for the major diplomas and are approved by the General Medical Council for pre-registration service.

Applications, giving the names and addresses of 2 referees, to be addressed to the Group Secretary of the Committee, 8, Windstreet, Neath.

**MID-KENT HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the West Kent General Hospital, and the Kent County Ophthalmic and Aural Hospital, Maidstone (total beds 254). The post, which is of Senior House Officer grade, will be vacant at end of July, 1960, and carries a salary of £852 6s. a year less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available and the post is recognised for the F.F.A. R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the name of 2 suitable referees, should be forwarded to the Administrative Officer, West Kent General Hospital, Maidstone.

**MORECAMBE. QUEEN VICTORIA HOSPITALS.** Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical). The successful applicant will be attached to the Specialist Unit. The post is normally tenable for 1 year.

Apply, stating age, qualifications and experience, and naming 2 medical referees, to the Group Secretary, Royal Lancaster Infirmary, Lancaster.

**NEWBURY DISTRICT HOSPITAL, Newbury, Berkshire.** (90 Beds.) SENIOR HOUSE OFFICER (mainly general surgery with some casualty). Post vacant immediately. A ground-floor flat suitable for a married person is available.

Applications, giving full details, with 3 names for reference, to Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

**NEWCASTLE. THE UNITED NEWCASTLE UPON** TYNE HOSPITALS. ROYAL VICTORIA INFIRMARY. Applications are invited for the whole-time non-resident appointment of REGISTRAR in the Department of Orthopædics at the Royal Victoria Infirmary which is the Teaching Hospital of the University of Durham. This is a busy department serving a large industrial area. Teaching and research facilities are available and the successful candidate will be required to do some teaching. The appointment is for 1 year in the first instance and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details, together with the names and addresses of 3 referees, should be sent to the House Governor and Secretary, Royal Victoria Infirmary, Newcastle upon Tyne, 1.

**NEWCASTLE. THE UNITED NEWCASTLE UPON** TYNE HOSPITALS. Applications are invited for the non-resident appointment of MEDICAL REGISTRAR at the Royal Victoria Infirmary. The person appointed will work in the Professorial Medical Unit. The appointment is for 1 year in the first instance and will be subject to the terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the House Governor and Secretary, Royal Victoria Infirmary, Newcastle upon Tyne, 1, within 2 weeks of the appearance of this advertisement.

**NEWCASTLE. THE UNITED NEWCASTLE UPON** TYNE HOSPITALS. Applications are invited for the non-resident appointment of SENIOR HOUSE OFFICER in the Department of Bacteriology at the Royal Victoria Infirmary. The successful applicant will assist in the general work of the laboratory, including blood-transfusion serology. Previous laboratory experience is not essential. The appointment will be for 1 year and will be subject to terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details, and the names and addresses of 3 referees, should be sent to the House Governor and Secretary, Royal Victoria Infirmary, Newcastle upon Tyne, 1, within 2 weeks of the appearance of this advertisement.

**NEWARK HOSPITAL. (70 Beds.) Applications are** invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (medical) ; duties to commence on 21st August, 1960. This Hospital is situated on the Great North Road, approximately 20 miles from Nottingham, and the post offers good experience. Furnished flat available. Salary and conditions of service in accordance with Ministry regulations. Applications are also invited for the above post on a locum basis, for the period 4th July–5th August inclusive.

Applications in writing, giving age, qualifications, experience, nationality, &c., together with the names of 2 referees, to be sent to the Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

**NEWTON ABBOT HOSPITAL. Resident Senior House** SURGEON, Male or Female, required end of June, to act as Casualty Officer and House Surgeon to special departments, together with relief duties. Ability to give outpatient anæsthetics advantageous. Married quarters available.

Applications (quoting ref. 364/41), stating qualifications, nationality, age, with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

**NORWICH HOSPITALS. Applications are invited for** the following appointments vacant 1st August, 1960. All are pre-registration posts:—

(1) **Norfolk and Norwich Hospital, Norwich**

HOUSE PHYSICIAN (2). Duties entirely general medical.

HOUSE SURGEON (2). Post recognised for final F.R.C.S. examination requirements. Duties entirely general surgical.

JUNIOR CASUALTY OFFICER. 2 Casualty Officers employed in the Department.

OBSTETRIC HOUSE SURGEON. 2 House Officers employed in the Department. Post recognised for final D.Obst. R.C.O.G. examination requirements.

(2) **Jenny Lind Hospital for Children, Norwich**

HOUSE PHYSICIAN at this Hospital which forms the entire Pædiatric Department of the United Norwich Hospitals. The duties are under the direct supervision of the Consultant Staff of the Norfolk and Norwich Hospital. Post recognised for D.C.H. examination requirements.

HOUSE SURGEON at this Hospital which forms the entire Pædiatric Department of the United Norwich Hospitals. The duties are under the direct supervision of the Consultant Staff of the Norfolk and Norwich Hospital.

(3) **West Norwich Hospital, Norwich**

HOUSE PHYSICIAN (2). Duties include medical and geriatrics. The beds at this Hospital are under the control of the Consultant Physicians of the Norfolk and Norwich Hospital, and the successful candidate will be required to undertake medical duties under their supervision.

HOUSE SURGEON (2). Post recognised for final F.R.C.S. examination requirements. Duties general surgical and including burns and plastic work. The beds at this Hospital are under the control of the Consultant staff of the Norfolk and Norwich Hospital.

(4) **Norfolk and Norwich Hospital, Norwich**

Applications are also invited for the following appointments vacant 1st August, 1960:—

SENIOR CASUALTY OFFICER. Senior House Officer status. 2 Casualty Officers employed in the Department. Post recognised for final F.R.C.S. examination requirements.

SENIOR OBSTETRIC HOUSE SURGEON. Senior House Officer status. 2 House Officers employed in the Department. Post recognised for final D.Obst. R.C.O.G. examination requirements.

SENIOR ORTHOPÆDIC HOUSE SURGEON (2). Senior House Officer status. 2 Orthopædic House Officers employed in the Department. Post recognised for final F.R.C.S. examination requirements.

SENIOR HOUSE OFFICER ANÆSTHETIST. Senior House Officer status. 2 House Officers employed in the Department. Post recognised for D.A. and F.F.A. R.C.S. examination requirements.

SENIOR HOUSE PHYSICIAN at West Norwich Hospital. Senior House Officer status. Married quarters available if required. Duties include general medical and infectious diseases. This post gives wide and varied experience, and is most suitable for those intending to enter general practice. The beds at this Hospital are under the control of the Consultant Physicians of the Norfolk and Norwich Hospital, and the successful candidate will be required to undertake medical duties under their supervision.

Membership of a Medical Defence Society is a condition of appointment in each case.

Applications giving full details, with names of 2 referees, to Group Secretary, Hospital Management Committee, St. Stephen's-road, Norwich, Norfolk, NOR 53A.

**NORTHWOOD, MIDDLESEX. MOUNT VERNON** HOSPITAL. Applications are invited for the post of HOUSE SURGEON to the Gynæcological Department of 25 Beds. This appointment is recognised for the M.R.C.O.G., and may be a pre-registration appointment.

Applications, accompanied by 2 testimonials, should be forwarded by 18th July, 1960, to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex.

**NORTHWOOD, MIDDLESEX. MOUNT VERNON** HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN for General Medicine and Dermatology. This is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, should be forwarded by 18th July, 1960, to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex.

**NORTHWOOD, MIDDLESEX. MOUNT VERNON** HOSPITAL. Applications are invited for the post of HOUSE SURGEON for General Surgery. Recognised for the Final F.R.C.S. in general surgery, and recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded by 18th July, 1960, to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex.

**NORTHWOOD, MIDDLESEX. MOUNT VERNON** HOSPITAL. Applications are invited for 2 posts of HOUSE PHYSICIAN to the Radiotherapy Department. These posts are recognised as pre-registration appointments.

Applications, accompanied by 2 testimonials, should be forwarded by 18th July, 1960, to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex.

**NORTHALLERTON. FRIARAGE HOSPITAL. (341** Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in the Orthopædic Department. The unit consists of 120 Beds dealing with long-stay and acute orthopædic cases. Good orthopædic experience is available and there is a certain amount of casualty work. The post is recognised under the F.R.C.S. regulations. Accommodation may be provided for wives of married medical staff.

Apply, with particulars of previous experience, and names of 2 referees, to the Group Secretary, Northallerton Hospital Management Committee, Friarage Hospital, Northallerton, as soon as possible.

**NORTHALLERTON. THE FRIARAGE HOSPITAL.** (341 Beds.) HOUSE SURGEON required from 1st August, 1960, pre-registration appointment, excellent surgical experience available.

Apply, with particulars of previous experience and the names and addresses of 2 referees, to the Group Secretary, Northallerton Hospital Management Committee, Northallerton.

**NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applica**tions are invited for the post of HOUSE PHYSICIAN, vacant 1st August, 1960. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

**NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applica**tions are invited for the post of SENIOR HOUSE OFFICER (pædiatrics). Vacant 18th July, 1960. The post is approved for the D.C.H.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Secretary, City Hospital, Hucknall-road, Nottingham.

**NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applica**tions are invited for the post of HOUSE OFFICER (obstetrics and gynæcology) (recognised for pre-registration purposes) which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for the M.R.C.O.G. and D.Obst. R.C.O.G. Post vacant 7th August, 1960.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

**NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applica**tions are invited for the post of SENIOR HOUSE OFFICER (medical). Post vacant 6th August, 1960. Acute medical and geriatric assessment cases. Excellent experience for higher qualifications or for subsequent entry into general practice.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 testimonials, should be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham, from whom particulars may be obtained.

**NOTTINGHAM GENERAL HOSPITAL. (467 Beds.)** Applications are invited for the 4 posts of Resident Pre-registration HOUSE SURGEON at the above Hospital with duties commencing mid/late July, 1960. 7 non-specialist general medical staff.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Nottingham No. 1 Hospital Management Committee.

**NOTTINGHAM GENERAL HOSPITAL. Senior House** OFFICER (anæsthetics) required. Duties to commence forthwith. Post recognised for the D.A. and the F.F.A. R.C.S. This is a busy General Hospital giving experience in all branches of surgery.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

**NOTTINGHAM GENERAL HOSPITAL. (467 Beds.)** SENIOR HOUSE OFFICERS (orthopædic and fracture) required with duties commencing mid-July and 11th August respectively. Posts offer exceptional experience of traumatic and orthopædic surgery with responsibilities under supervision in accident and orthopædic wards (66 Beds), also accident, orthopædic outpatient and physiotherapy clinics. The accident experience is very extensive as cases treated include domestic, industrial, road and coalmining injuries. The experience available includes head and spinal injuries.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary, Nottingham No. 1 Hospital Management Committee.

**NOTTINGHAM GENERAL HOSPITAL. (467 Beds.)** NOTTINGHAM NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum Resident Pre-registration HOUSE PHYSICIAN at the above Hospital for the period 25th June–24th July inclusive.

Applications to the Group Secretary as soon as possible.

**NOTTINGHAM GENERAL HOSPITAL. (467 Beds.)** Applications are invited for the posts of RESIDENT SENIOR HOUSE OFFICERS (surgical) at the above Hospital, with duties commencing late July and early August, 1960.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Nottingham No. 1 Hospital Management Committee.

**NOTTINGHAM GENERAL HOSPITAL. (467 Beds.)** NOTTINGHAM NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the 2 posts of Resident Pre-registration HOUSE PHYSICIAN at the above Hospital with duties commencing early/mid July, 1960. 7 non-specialist general medical staff.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary.

**NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, Nott**INGHAM. SENIOR HOUSE OFFICER (surgical) required. This post, which becomes vacant on 4th July, 1960, provides good opportunity for experience in all types of general surgery.

Applications, stating age, nationality, qualifications, &c., with the names of 3 referees, to be sent as soon as possible to the Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

**NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell,** NOTTINGHAM. Applications are invited for the post of SENIOR HOUSE OFFICER for the Obstetrical and Gynæcological Department (41 obstetric, 11 gynæcological beds, with small block for puerperal pyrexia cases) which becomes vacant on 1st July, 1960. The post is recognised for the D.Obst.R.C.O.G. examination. Preference will be given to candidates who have experience in obstetrics and gynæcology.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 testimonials, to be sent to the Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

**NUNEATON. GEORGE ELIOT HOSPITAL. (275 Beds.)** HOUSE OFFICER in Pædiatrics. Vacant 31st August. Pre-registration. Recognised D.C.H.

Applications to Hospital Secretary.

**NUNEATON. GEORGE ELIOT HOSPITAL. (275 Beds.)** HOUSE SURGEON (general surgery). Vacant 9th August. Pre-registration. Recognised F.R.C.S. Resident.

Applications to Hospital Secretary.

**NUNEATON. MANOR HOSPITAL. (125 Beds.) House** SURGEON (traumatic and orthopædic surgery). Vacant 1st August. Recognised F.R.C.S. Resident.

Applications to Hospital Secretary.

**OXFORD. LITTLEMORE HOSPITAL and the ASH-**HURST CLINIC. (900 Beds.) SENIOR HOUSE OFFICER. The Hospital serves the City and County of Oxfordshire—population 330,000 and is actively developing a comprehensive community psychiatric service with day hospital facilities and extending outpatient clinics. Opportunities for experience in every branch of adult psychiatry. Emphasis on teaching; university facilities and amenities nearby.

Applications to Physician-Superintendent within 14 days.

**OXFORD. THE UNITED OXFORD HOSPITALS.** Applications invited for Locum SENIOR HOUSE PHYSICIAN post to the General Physicians at the Churchill Hospital for the month of July.

Applications, giving details of qualifications, and the names of 2 referees, to the Administrator, Radcliffe Infirmary, Oxford, as soon as possible.

**OXFORD. THE UNITED OXFORD HOSPITALS. The** RADCLIFFE INFIRMARY, OXFORD. SENIOR REGISTRAR in Chemical Pathology required for the Nuffield Department of Clinical Biochemistry. Facilities for training in all branches of the subject will be provided. The appointment will be for 1 year in the first instance, renewable annually subject to satisfactory work and progress.

Further details and forms of application from the Administrator, the Radcliffe Infirmary, Oxford. Applications to be received not later than 16th July, 1960.

**OXFORD. UNITED OXFORD HOSPITALS. Applications** are invited for the post of REGISTRAR in Pathology at the Radcliffe Infirmary. The post is intended for candidates who wish to gain greater experience in all branches of pathology and there will be opportunities to work in the various departments of the Laboratory.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, from whom further particulars can be obtained, should be received by him not later than 16th July, 1960.

**OXFORD. UNITED OXFORD HOSPITALS. Applications** are invited for the post of NON-RESIDENT REGISTRAR in the Department of Anæsthetics, for 1 year in the first instance, eligible for an extension for a second year.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 16th July, 1960.

**OXFORD. UNITED OXFORD HOSPITALS. Applications** are invited for the post of RESIDENT SENIOR HOUSE OFFICER in the Department of Anæsthetics at the Radcliffe Infirmary. The appointment will be for 6 months in the first instance and extendable up to 1 year.

Application, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 16th July, 1960.

**OXFORD. UNITED OXFORD HOSPITALS.** Applications invited for the post of SENIOR REGISTRAR in the Radiotherapy Department at the Churchill Hospital.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, to be received by him not later than 16th July, 1960.

**PAISLEY. INFECTIOUS DISEASES HOSPITAL,** Hawkhead-road. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER at Infectious Diseases Hospital, Paisley, for a 6- or 12-month period from 1st August, 1960. Resident post. The post offers a wide experience in infectious diseases and tuberculosis. Opportunities are available for postgraduate study and research.

Applications, with names of 2 referees, should be submitted to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

**PAISLEY. INFECTIOUS DISEASES HOSPITAL,** Hawkhead-road. HOUSE OFFICER (pre- or post-registration). Post vacant on 1st August, 1960.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

**PAISLEY. ROYAL ALEXANDRA INFIRMARY.** Junior HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER required for Orthopædic and Fracture Unit, at present vacant. The post is resident.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

**PAISLEY. ROYAL ALEXANDRA INFIRMARY.** House SURGEON required for Orthopædic and Fracture Unit. Post vacant from 1st August, 1960.

Applications to Group Medical Superintendent.

**PAISLEY. ROYAL ALEXANDRA INFIRMARY ANNEXE.** JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER required for general duties, relieving in Chronic Sick Unit and Casualty Department.

Applications, giving names of 2 referees, to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

**PERTH. COUNTY AND CITY OF PERTH GENERAL HOSPITALS.** The following posts will fall vacant on 1st August, 1960 :—

**Perth Royal Infirmary**

HOUSE PHYSICIAN. General medical wards.
HOUSE SURGEON. General surgical wards.

**Bridge of Earn Hospital**

HOUSE SURGEON. General surgical wards.
SENIOR HOUSE SURGEON. General surgical wards.
3 HOUSE SURGEONS. Orthopædic Unit.
3 SENIOR HOUSE SURGEONS. Orthopædic Unit.
HOUSE SURGEON or SENIOR HOUSE SURGEON. E.N.T. Department.

Applications giving age, qualifications, experience, and names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

**PLYMOUTH GENERAL HOSPITAL GROUP.** Department of Anæsthetics. SENIOR RESIDENT ANÆSTHETIST (Junior Hospital Medical Officer grade) and SENIOR HOUSE OFFICER required for general duties in the Clinical Area. Tuition given for higher examinations.

Apply, stating age, nationality, qualifications and experience, and giving names and addresses of 3 referees, to the Group Secretary, 7, Nelson-gardens, Plymouth.

**PLYMOUTH GENERAL HOSPITAL GROUP.** Department of Dental and Oral Surgery. Vacancy for DENTAL HOUSE SURGEON from 1st July. The post is recognised for F.D.S.

Applications, with full details including qualifications and nationality, and names of 2 referees, to the Group Secretary, 7, Nelson-gardens, Plymouth.

**PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE.** ANÆSTHETIST (Junior Hospital Medical Officer grade) required.

Applications, personally or in writing, as soon as possible to the Group Secretary, Great Northern House, Salter-row, Pontefract, Yorkshire.

**PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE.** Locum ANÆSTHETIST (Junior Hospital Medical Officer) required.

Applications, personally or in writing, as soon as possible to the Group Secretary, Great Northern House, Salter-row, Pontefract, Yorkshire.

**PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.**

**Saint Mary's Hospital** (691 Beds)

Medical, 74 medical beds.
HOUSE PHYSICIAN (pre-registration). Vacant 1st August, 1960.

**Queen Alexandra Hospital** (515 Beds)

Surgery, 87 surgical beds.
HOUSE SURGEON. Vacant 23rd August, 1960.

**Royal Portsmouth Hospital** (254 Beds)

Surgery, 70 surgical beds.
SENIOR HOUSE SURGEON. Vacant 1st July, 1960.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible. L. C. ROGERS, Group Secretary.
Saint Mary's Hospital, Milton-road, Portsmouth.

**PORTSMOUTH. ROYAL PORTSMOUTH HOSPITAL.** (254 Beds.) CASUALTY OFFICER (Junior Hospital Medical Officer grade). Vacant 1st October, 1960. Main Accident Hospital for the Portsmouth area. Tenure of office for 3 years subject to review annually. Resident on duty.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible.

L. C. ROGERS, Group Secretary,
Portsmouth Group Hospital Management Committee.
Saint Mary's Hospital, Milton-road, Portsmouth.

**PRESTON ROYAL INFIRMARY.** (409 Beds.) Senior HOUSE OFFICER required in E.N.T. Department. Post vacant 1st August, 1960.

Applications, with names of 2 referees, to Group Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston, Lancs.

**PRESCOT. WHISTON HOSPITAL.** (892 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST in the Senior House Officer grade. The post is recognised for training for the Fellowship of the Faculty of Anæsthetists.

Applications, stating age, qualifications and experience, and giving 2 names for reference, to N. RICHARDS, Group Secretary, Whiston Hospital, Prescot, Lancs.

**READING AND DISTRICT ACCIDENT AND ORTHOPÆDIC SERVICE, BATTLE HOSPITAL, READING, BERKSHIRE.** JUNIOR HOUSE OFFICER required, post vacant 22nd June, 1960. Pre- or post-registration. General duties in the service team; including casualty. F.R.C.S. recognised.

Applications to Secretary.

**REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY.** REGISTRAR in Anæsthetics required for duties in Group, primarily at Redhill County Hospital. Recognised for D.A. Post vacant immediately. Married quarters available.

Application forms from Group Secretary, Redhill Group Hospital Management Committee, Earlswood Mount, Redhill, Surrey.

**REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY.** Locum Tenens MEDICAL REGISTRAR. Required for period 16th July–6th August, 1960.

Applications to Group Secretary, Earlswood Mount, Pendleton-road, Redhill, or telephone Redhill 3581.

**REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY.** SENIOR HOUSE OFFICER. Mainly surgical with some casualty duties. Post vacant immediately.

Applications to Hospital Secretary.

**RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.**

**Tredegar Hospital.** Surgical unit of 50 Beds plus 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy outpatients, casualty and radiological departments. Married quarters.

HOUSE SURGEON (1st August) with opportunity to follow on House Physician or House Officer (obstetrics) if satisfactory.

**Caerphilly and District Hospital.** (General hospital, 226 Beds.) 6 miles from Cardiff. Married quarters. Vacancies 1st August.

HOUSE SURGEONS (2), 1 for general surgical wards and 1 for part general surgical and part orthopædic wards. Both pre-registration posts recognised for F.R.C.S.

HOUSE PHYSICIAN.

Applications for these pre-registration appointments to the Group Secretary, Central Offices, Cærphilly-road, Ystrad Mynach, Hengoed, Glam.

**ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** HOUSE OFFICER (surgery) required beginning of July for busy surgical unit at Birch Hill Hospital. Post is recognised for F.R.C.S. qualification and offers excellent experience.

Apply, Group Secretary, Birch Hill Hospital, Rochdale.

**ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** HOUSE OFFICER (medicine) required mid-June at Birch Hill Hospital. Post offers excellent experience.

Apply Group Secretary, Birch Hill Hospital, Rochdale.

**ROCHDALE. BIRCH HILL HOSPITAL.** House Officer (obstetrics and gynæcology), required immediately. Pre- or post-registration post of 6 months' duration. Recognised for D.Obst.R.C.O.G.

Apply to Group Secretary, Rochdale and District Hospital Management Committee, Birch Hill Hospital, Rochdale.

**ROCHFORD, ESSEX. GENERAL HOSPITAL.** (620 Beds.) Locum REGISTRAR in Pathology required. Post now vacant.

Applications, stating age, with copies of testimonials, &c., to be sent to the Secretary immediately.

**ROMFORD, ESSEX. RUSH GREEN HOSPITAL.** (301 Beds.) RESIDENT HOUSE SURGEON (general surgery), Male or Female, required from 11th July, 1960. Post is approved for pre-registration purposes and is recognised for F.R.C.S.

Applications, with names of 2 referees, quoting Ref. 16/115, to Secretary, Romford Group Hospital Management Committee, Oldchurch-road, Romford.

**ROMFORD, ESSEX. RUSH GREEN HOSPITAL.** (301 Beds.) RESIDENT HOUSE SURGEON, Male or Female, required immediately for duties mainly in the E.N.T. Department and also including work in receiving room and surgical wards. Post open to pre-registration applicants or fully registered practitioners and recognised for the D.L.O.

Apply to Group Secretary, Romford Hospital Management Committee, Oldchurch-road, Romford, enclosing copies of testimonials or names of 2 referees.

**RUGBY. HOSPITAL OF ST. CROSS.** (168 Beds.) House SURGEON (general surgery). 2 posts. Pre-registration. Recognised F.R.C.S. Vacant 10th July. Resident.

Applications to Hospital Secretary.

**RUGBY. HOSPITAL OF ST. CROSS.** (168 Beds.) CASUALTY AND ACCIDENT OFFICER. Junior Hospital Medical Officer status. Vacant 8th August. Resident. Recognised F.R.C.S. Duties include orthopædic surgery. Post suitable for candidate reading for higher qualification.

Applications to Hospital Secretary.

**SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOSPITAL. WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE.** Locum SURGICAL REGISTRAR required from 15th July to 28th August 1960, inclusive.

Apply Hospital Secretary, Southlands Hospital.
A. V. OAKTON, Group Secretary.

**SALISBURY GENERAL HOSPITAL.** Applications are invited for the post of RESIDENT HOUSE PHYSICIAN for a period of 6 months from 19th August, 1960. Post open to pre-registration candidates.

Apply, enclosing copies of 2 recent testimonials, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

**SALISBURY GENERAL HOSPITAL.** Applications are invited for the combined appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order for a period of 6 months in each post starting 19th August, 1960. Post open to pre-registration candidates.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary, General Infirmary, Salisbury.

**SALISBURY GENERAL HOSPITAL.** Locum Orthopædic REGISTRAR (resident) required for 6 months. Post vacant 1st September and offers wide practical experience in traumatic and general orthopædics, including children.

Apply as soon as possible, giving names of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

**SALFORD. HOPE HOSPITAL.** Manchester Regional HOSPITAL BOARD. SALFORD HOSPITAL MANAGEMENT COMMITTEE. PÆDIATRIC REGISTRAR required at the above Hospital, post vacant mid-July. The department comprises 75 medical beds and, in addition, pædiatric supervision of children's surgical beds, also the neonatal nurseries of the Obstetrical Department (approximately 70 lying-in beds). The department is recognised by the University for undergraduate teaching of pædiatrics.

Applications, together with names of 2 referees, to be sent to Group Secretary, Salford Royal Hospital, Salford, 3, before 2nd July, 1960.

**SALFORD HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER (resident) required for duties in E.N.T. Departments at Hope Hospital, Salford, 6, and Salford Royal Hospital, Salford, 3. New post. The staff in the departments consists of 2 Consultant Surgeons and 2 Registrars. 40 Beds are allocated between the 2 hospitals. Experience in all branches of E.N.T. surgery available.

Applications, together with names and addresses of 2 referees, to Group Secretary, Salford Royal Hospital, Salford, 3, before 2nd July, 1960.

**SCOTLAND. EASTERN REGIONAL HOSPITAL** BOARD. Orthopædic Surgery. DUNDEE ROYAL INFIRMARY and BRIDGE OF EARN HOSPITAL, PERTHSHIRE. Applications are invited for 2 appointments as REGISTRAR in Orthopædic Surgery for the Orthopædic Units at Dundee Royal Infirmary and Bridge of Earn Hospital, Perthshire. Previous experience in orthopædic surgery is essential.

Further particulars and forms of application from the Secretary to the Board, Vernonholme, Riverside-drive, Dundee, with whom applications should be lodged not later than 9th July, 1960.

**SCOTLAND. EASTERN REGIONAL HOSPITAL** BOARD. Anæsthetics. DUNDEE TEACHING HOSPITALS. Applications are invited for a post as SENIOR REGISTRAR in Anæsthetics in the Dundee Teaching Hospitals—Dundee Royal Infirmary (549 Beds) and Maryfield Hospital, Dundee (370 Beds), the main general teaching hospitals associated with the University of St. Andrews. There will be associated with the appointment an Honorary Tutorship in Clinical Anæsthesia in the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Forms of application and further particulars from the Secretary to the Board, Vernonholme, Riverside-drive, Dundee, with whom applications must be lodged not later than 9th July, 1960.

**SCOTLAND. WESTERN REGIONAL HOSPITAL** BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Obstetrics and Gynæcology based at Bellshill Maternity Hospital for duties in the Lanarkshire Area Maternity Service.

SENIOR REGISTRAR in Psychiatry at the Southern General Hospital, Glasgow, and with duties in Forensic Psychiatry at H.M. Prison, Barlinnie, Glasgow.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 351, Sauchichall-street, Glasgow, C.2, by 9th July, 1960.

**SHEFFIELD, 6. MIDDLEWOOD HOSPITAL. (2000 Beds.)** SHEFFIELD NO. 2 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from Male or Female officers for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER at Middlewood Mental Hospital. Only single accommodation available. There are good facilities for post-graduate study for the D.P.M. and there is full collaboration with the general hospital situate in the same grounds. Excellent laboratory and other special departments. Extensive psychiatric outpatient service.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be forwarded immediately to the Medical Superintendent.

**SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS.** Applications invited for the following posts :—

(*a*) OPHTHALMIC REGISTRAR at the Royal Hospital. Applications not later than 9th July, 1960.

(*b*) REGISTRAR in Anæsthetics. Post vacant 25th August. The successful candidate will be required to work in any of the units of the United Sheffield Hospitals. Applications not later than 9th July, 1960.

(*c*) SENIOR HOUSE OFFICER to the University Department of Surgery. Applications not later than 9th July, 1960.

Applications for all posts should state age, education, qualifications and experience, together with names and addresses of 3 referees, and should be addressed as follows :—

Posts (*a*) and (*b*) to Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

Post (*c*) to Superintendent, Royal Infirmary, Sheffield, 6.

**SHEFFIELD REGIONAL HOSPITAL BOARD.** Sheffield NO. 4 HOSPITAL MANAGEMENT COMMITTEE. Radiotherapy Services. Applications are invited for the post of Locum Tenens SENIOR HOUSE OFFICER RESIDENT RADIOLOGICAL OFFICER for duty in the Royal Infirmary wards of the Sheffield National Centre for Radiotherapy. The appointment will be for 3 months, the position being reviewed at the end of that period. Should the officer appointed hold a high medical qualification or be in possession of the D.M.R.T. or have passed part I of the examinations for the Diploma his status will be that of Registrar. The pay of a locum tenens Senior House Officer is £16 12s. per week.

Applications and requests for further particulars should be addressed to the Secretary, Broom Cross, Tree Root-walk, Sheffield, 10.

**SHREWSBURY. CROSS HOUSES HOSPITAL.** Obstetric HOUSE SURGEON with gynæcological duties. Vacant 14th July.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital. Shrewsbury.

**SHREWSBURY. EYE, EAR AND THROAT HOSPITAL.** SENIOR HOUSE OFFICER (E.N.T.). Duties at E.N.T. Hospital (67 Beds) and Copthorne Hospital (193 Beds). Post recognised for the D.L.O. and F.R.C.S. Vacant 1st August, 1960.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital, Shrewsbury.

**SHREWSBURY. ROYAL SALOP INFIRMARY.** Shrewsbury HOSPITAL GROUP. HOUSE SURGEON. Vacant 5th July. Pre-registration candidates eligible. Recognised for F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Copthorne Hospital, Shrewsbury.

**SIDCUP, KENT. QUEEN MARY'S HOSPITAL.** Locum SENIOR HOUSE OFFICER (medicine) required from 4th July to 31st July inclusive.

Applications in writing to Secretary.

**SLOUGH. UPTON HOSPITAL.** House Surgeon, 1 of 2, required 19th July. Pre-registration post recognised for F.R.C.S. In addition to general surgery, post offers experience in a Male accident ward, including neurosurgical, plastic, &c., cases.

Applications, with names of 2 referees, to Secretary.

**SLOUGH. UPTON HOSPITAL.** House Physician required 29th July. Pre-registration post offering considerable experience in general acute medical work.

Applications, with names of 2 referees, to Secretary.

**SLOUGH. UPTON HOSPITAL.** Locum Senior Surgical REGISTRAR required 1st–21st August.

Applications, with names of 2 referees, to Secretary.

**SOUTHAMPTON CHILDREN'S HOSPITAL.** (Recognised by Conjoint Board for D.C.H.) (Establishment : 1 Registrar and 4 House Officers.) HOUSE OFFICER (post-registration) required immediately. The post offers wide experience in pædiatrics, and preference will be given to candidates intending to specialise.

Applications, stating full details, together with 2 copies of recent testimonials, to be forwarded to the Group Secretary, Southampton Group Hospital Management Committee, Tremona-road, Shirley, Southampton.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL** BOARD. Applications are invited for an appointment available from 1st July for 1 year in the first instance as Whole-time REGISTRAR in Chest Diseases to Preston Hall Hospital, British Legion Village, Maidstone, Kent. The appointment will be for work in general tuberculosis and will provide experience with a major surgical unit and also at chest clinics. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis in adults.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, not later than 9th July.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL** BOARD. Applications are invited for a vacant appointment of Whole-time REGISTRAR in Geriatrics to the Bromley Group of hospitals (but with reciprocal arrangements for off-duty with the Geriatric Registrar in the Orpington and Sevenoaks Group). This is an active geriatric unit still in the process of development. It already has full facilities for investigation and rehabilitation and a full almoning service. Duties will include domiciliary visiting and the day-to-day adminstration of the Unit in addition to routine ward work.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, not later than 9th July.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL** BOARD. Applications are invited for a resident appointment for 1 year in the first instance as Whole-time REGISTRAR in Obstetrics and Gynæcology to the Tunbridge Wells Group of hospitals for duties mainly at Pembury Hospital.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, 40, Eastbourne-terrace, London, W.2, not later than 9th July.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL** BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Orthopædic Surgery (resident or non-resident) to the Tunbridge Wells Group of hospitals for duties mainly at Pembury Hospital available on 2nd August, 1960, for 1 year in the first instance. There is a wide variety of short- and long-stay work and fractures; 6 months of the service in this post is recognised for the F.R.C.S.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, not later than 2nd July.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for appointment, for 1 year in the first instance, of a Whole-time REGISTRAR in Psychiatry to St. Augustine's and St. Martin's Hospitals, Chartham Down, near Canterbury, Kent. Post recognised for the D.P.M. examination and will give experience in adolescent and children's work. A flat will be available for a married man or single accommodation is available. Previous experience in general medicine is desirable.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 2nd July.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for an appointment available from 16th August, 1960, for 1 year in the first instance of REGISTRAR in Psychiatry to the Brighton and Lewes Group of hospitals. The appointment is for the Psycho-geriatric Unit at Brighton General Hospital, where a Consultant Geriatrician and a Consultant Psychiatrist both attend, and will also include general duties in other geriatric blocks at this hospital, and in the long-stay wards. The holder of the appointment will be expected to undertake relief duties for the Psychiatric Registrar to the Observation Unit at the same hospital.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, not later than 2nd July.

**SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited for an appointment for 1 year in the first instance as Whole-time REGISTRAR in Obstetrics and Gynæcology for duties primarily in the Isle of Thanet Group of hospitals but with occasional work in the Canterbury Group. Furnished flat suitable for married man available.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 2nd July.

**SOUTHEND GENERAL HOSPITAL, Southend-on-Sea, ESSEX.** (272 Beds.) Orthopædic and Fracture Department. SENIOR HOUSE OFFICER required. Resident. The Orthopædic and Fracture Department is the centre for reference of all cases from a large surrounding area and the post offers excellent experience in all aspects of orthopædic and traumatic surgery. Post recognised for the F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to reach the Secretary as soon as possible.

**SOUTHEND GENERAL HOSPITAL, Southend-on-Sea, ESSEX.** (272 Beds.) CASUALTY OFFICER required. Senior House Officer grade. Resident. Opportunities for inpatient and outpatient duties in the Orthopædic and Fracture Department, if desired. Post vacant 1st August, 1960. Recognised for F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to reach the Secretary as soon as possible.

**SOUTHEND GENERAL HOSPITAL, Southend-on-Sea, ESSEX.** (272 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required end July, 1960. Resident. The post is recognised for the M.R.C.O.G.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to reach the Secretary as soon as possible.

**SOUTHPORT GENERAL INFIRMARY. (189 Beds.** Recognised for pre-registration.)

JUNIOR HOSPITAL MEDICAL OFFICER (whole-time casualty).

HOUSE PHYSICIAN (general medicine and ophthalmology).

HOUSE SURGEON (general surgery and gynæcology).

Appointments vacant in July and August. House Surgeon post recognised for F.R.C.S. Married quarters available for Casualty Officer.

Apply, stating age, qualifications, nationality, experience, and post required, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

**STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY.** Pre-registration HOUSE PHYSICIAN/HOUSE SURGEON. Medical post now available, but an option will be given to candidates to contract for 12 months' service, in which case surgical post will be available after 6 months. 8 residents.

Applications, with names for reference, to Group Secretary, Stafford Hospital Management Committee, 22B, Greengate-street, Stafford.

**STAFFORDSHIRE HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER (anæsthetics) required. Post recognised for D.A. Duties mainly at Staffordshire General Infirmary, Stafford. Resident post.

Applications, giving details of experience, and 2 names for reference, to Group Secretary, Stafford Hospital Management Committee, 22B, Greengate-street, Stafford.

**STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER required immediately for 1 year for a developing active geriatric unit under the charge of a Consultant Geriatric Physician. The post offers experience in the investigation and treatment of acute and chronic diseases of the aged, and facilities for study will be available. A locum for shorter periods would be considered until the appointment is filled.

Applications, with full particulars, and the names of 2 referees, to be forwarded to the undersigned.

E. J. DURRANT, Group Secretary.

59B, Shaw-heath, Stockport.

**STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the following pre-registration posts :—

**Stockport Infirmary** (169 Beds)

HOUSE OFFICER (surgery and E.N.T.), vacant 17th August, 1960. Recognised for the F.R.C.S. and D.L.O.

HOUSE OFFICER (surgery), vacant 1st September, 1960. Recognised for the F.R.C.S.

HOUSE OFFICER (surgery), vacant now. Recognised for the F.R.C.S.

**Stepping Hill Hospital, Stockport** (526 Beds)

HOUSE OFFICER (medicine), vacant 1st August, 1960.

HOUSE OFFICER (medicine), vacant 10th September, 1960.

HOUSE OFFICER (obstetrics), vacant 1st September, 1960. Recognised for the D.Obst.R.C.O.G.

Applications, with full particulars and copies of 2 testimonials, should be addressed to the undersigned.

E. J. DURRANT, Group Secretary.

59B, Shaw-heath, Stockport.

**STOCKPORT INFIRMARY. (163 Beds.) Stockport and BUXTON HOSPITAL MANAGEMENT COMMITTEE.** Locum HOUSE SURGEON required.

Applications, with full particulars, and the names of 2 referees, to be forwarded to the undersigned.

E. J. DURRANT, Group Secretary.

59B, Shaw-heath, Stockport.

**ST. ALBANS CITY HOSPITAL. (394 Beds) and WELWYN GARDEN CITY MATERNITY HOSPITAL** (30 Beds). 2 Locum Tenens GYNÆCOLOGICAL AND OBSTETRIC REGISTRARS, resident, required, 1 from 2nd to 31st July, 1960, and the other from 11th to 19th July, 1960.

Applications, stating clearly post applied for, to Secretary, Mid Herts Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

**STIRLING AND CLACKMANNAN HOSPITALS BOARD OF MANAGEMENT.** Applications are invited for posts as HOUSE SURGEON, pre- or post-registration, at Stirling Royal Infirmary for the period commencing 1st August, 1960. The posts are recognised for F.R.C.S.

Applications should be sent immediately to the Group Medical Superintendent, Stirling Royal Infirmary.

**SULLY HOSPITAL (Thoracic Centre of 318 Beds), Sully, PENARTH, GLAMORGANSHIRE.** SENIOR HOUSE OFFICER (medical) required mid-August at above Hospital. Experience available in investigation and treatment of all lung and heart diseases in adults and children.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

**SUTTON AND CHEAM HOSPITAL (Maternity Annexe), Cedar-road, SUTTON, SURREY.** GENERAL PRACTITIONER OBSTETRICIAN for 2 sessions weekly. Applicants should live within 5-mile radius of the Annexe.

Apply, with full particulars, and names of 2 referees, to the Group Secretary, St. Helier Group Hospital Management Committee, St. Helier Hospital, Carshalton, Surrey, by 8th July, 1960.

**SWANSEA HOSPITAL, Swansea. (412 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the post of Locum SENIOR HOUSE OFFICER in the E.N.T. Department of the above Hospital for the period July and August 1960.

Applications, stating age, qualifications and experience, should be forwarded to the Hospital Secretary.

**SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics at the above Hospital. Resident/non-resident. The post is recognised for both D.A. and F.F.A. R.C.S. Immediate vacancy. The Hospital is a regional centre for thoracic and neuro surgery with wide experience in general, orthopædic and obstetric anæsthesia. Ample study-time allowed and encouraged. Normal establishment 1 Registrar and 2 Senior House Officers.

Applications, giving full particulars, together with the names of 2 referees, should be sent to the Medical Superintendent of the Hospital. T. E. JONES, Group Secretary.

**SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** Pre-registration RESIDENT HOUSE PHYSICIAN required for acute medical unit of 32 Beds at St. Margaret's Hospital.

Full details, with 2 testimonials, to Secretary, 7, Okus-road, Swindon.

**SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** Resident Pre-registration HOUSE SURGEON required for General Surgical Unit of 80 Beds at Victoria Hospital, Swindon. Recognised for F.R.C.S. Married accommodation available.

Full details, giving names of 3 referees, to Secretary, 7, Okus-road, Swindon.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** SENIOR HOUSE OFFICER (anæsthetics) required. Post vacant shortly. Recognised for F.F.A.R.C.S. and D.A. Excellent experience. Medical library facilities available.

Applications with copy testimonials to the Secretary at the Royal Infirmary as soon as possible.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** (455 Beds.) SENIOR HOUSE OFFICER (general medicine and neurology) required. Duties in general medicine include responsibility for acute medical admissions and in neurology for inpatient and outpatient work. The post offers excellent opportunities for postgraduate study.

Applications with copy testimonials (2), to Hospital Secretary.

**STOKE-ON-TRENT. CITY GENERAL HOSPITAL.** HOUSE PHYSICIANS (general medicine) required. 2 posts vacant 2nd August and 9th September. Pre-registration posts. Charge of 40 Beds. No casualty work.

Applications, with copy testimonials, to the Hospital Secretary. Final-year students awaiting examination results are also invited to apply.

**STOKE-ON-TRENT. CITY GENERAL HOSPITAL.** (815 Beds.) HOUSE PHYSICIAN (cardiology, dermatology and general medicine) required. Pre-registration post, vacant 4th October. Charge of 40 Beds. No casualty work.

Applications, with copy testimonials, to the Hospital Secretary, Final-year students awaiting examination results are also invited to apply.

**STOKE-ON-TRENT. CITY GENERAL HOSPITAL.** (815 Beds.) The following SENIOR HOUSE OFFICER posts will fall vacant in the next few months :—

*Obstetrics and Gynæcology* (12-month appointment). Recognised M.R.C.O.G./D.Obst.R.C.O.G., vacant 18th October. 100 obstetric, 40 gynæcological beds. Staff includes Senior Registrar, Registrar, and 2 House Surgeons.

*Ear, Nose and Throat Department* (6-month appointment). Recognised for D.L.O., vacant 22nd August. Unit of 40 Beds. Staff includes 1 Registrar.

*Pædiatrics* (12-month appointment). Recognised D.C.H., vacant 9th September. 73 Beds and also premature baby unit and charge of neonatal cases in Obstetric Department. Staff includes 1 House Physician.

*General Surgery* (6-month appointment). Recognised F.R.C.S., vacant 4th August. Unit of 40 Beds offers wide experience in general and genitourinary surgery. No casualty work.

*General and Thoracic Surgery and Neurosurgery.* Recognised F.R.C.S., vacant 8th August. Unit of 40 Beds offers wide experience in all 3 branches of surgery. No casualty work.

Applications, giving details of previous experience, together with copy testimonials, should be addressed to the Hospital Secretary.

**TAPLOW, near MAIDENHEAD. CANADIAN RED** CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 18th August. Pre-registration post.

Applications, stating age, qualifications, with dates, with copies of 2 testimonials, to Secretary.

**TAPLOW, near MAIDENHEAD. CANADIAN RED** CROSS MEMORIAL HOSPITAL. RESIDENT ANÆSTHETIC REGISTRAR required immediately. Post recognised for F.F.A.R.C.S.

Application forms from, and returnable to, Secretary, Windsor Hospital Management Committee, Alma-road, Windsor, by 30th June.

**TAPLOW, near MAIDENHEAD. CANADIAN RED** CROSS MEMORIAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics), vacant 5th July. Post tenable for 1 year. Resident.

Applications, stating age and qualifications, with 2 recent testimonials, to Secretary.

**TAPLOW, near MAIDENHEAD. CANADIAN RED** CROSS MEMORIAL HOSPITAL. Locum OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR required 15th August–4th September, inclusive.

Applications, stating age, qualifications, with dates, with copies of 2 testimonials, to Secretary.

**TAUNTON AND SOMERSET HOSPITAL. House Officer** (E.N.T.) required. Post-registration appointment. Recognised for F.R.C.S. and D.L.O. Post vacant 7th August, 1960.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

**TAUNTON AND SOMERSET HOSPITAL. House Officer** (general surgery) required. Post vacant 1st August, 1960. Pre-registration post recognised for F.R.C.S.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

**TAUNTON AND SOMERSET HOSPITAL. Junior Hos**PITAL MEDICAL OFFICER (Male or Female) required for full-time resident orthopædic and casualty work. 2 other Junior Hospital Medical Officers employed. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

**TILBURY AND RIVERSIDE GENERAL HOSPITAL.** ORSETT BRANCH, ORSETT, ESSEX. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE PHYSICIAN with pædiatric and other medical duties at the above Hospital. The post, which becomes vacant mid-July, is for 6 months in the first instance and is recognised for the D.C.H.

Applications, together with copies of recent testimonials, should be forwarded to the Group Secretary, Tilbury and South East Essex Hospital Management Committee, Thurrock Hospital, Grays, Essex.

**TRURO. ROYAL CORNWALL INFIRMARY.** Applications are invited for the post of HOUSE SURGEON (pre-registration), vacant now.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent references, to be addressed to the Hospital Secretary.

**TRURO. ROYAL CORNWALL INFIRMARY. (220 Beds.)** Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics). The post offers great experience in orthopædic and accident surgery, covering most of the County of Cornwall and with outpatient clinics at 7 hospitals.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent references, to be addressed to the Hospital Secretary.

**TORQUAY. TORBAY HOSPITAL. (194 Beds.) Resident** SENIOR HOUSE OFFICER (surgery) required mid-August. Post recognised for F.R.C.S. Complement of 8 Resident House Officers.

Applications, stating qualifications, age, nationality, with copy testimonials, to Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay.

**TORQUAY. TORBAY HOSPITAL. (194 acute general** beds.) HOUSE OFFICER (medicine), Male or Female, required end of June. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting ref. 955/91), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

**TORQUAY. TORBAY HOSPITAL. (194 general wards.)** SENIOR HOUSE OFFICER (medicine) required end August, with responsibility for general medical and infectious diseases beds. Present complement of House Officers 8. Married quarters available.

Applications, stating qualifications, nationality and age, together with copy testimonials (quoting reference 955/93) to Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

**WAKEFIELD. CLAYTON HOSPITAL. Casualty Officer** (Junior Hospital Medical Officer grade—or Senior House Officer, depending on experience) required. Salary and conditions of service in accordance with Whitley Council agreements.

Application form obtainable from the Group Secretary, Wakefield A Group Hospital Management Committee, 113, Northgate, Wakefield.

**WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL.** Applications invited for the position of SENIOR HOUSE OFFICER in the General Medical Department. Salary £852 6s. p.a. £150 p.a. charged for accommodation.

Address written applications, giving full personal particulars, details of experience, and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

**WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL.** HOUSE SURGEON required for the General Surgical Department.

Address written applications, giving full particulars, details of experience, and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

**WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL.** Applications invited for the post of SENIOR HOUSE OFFICER or HOUSE OFFICER in Gynæcology.

Address written applications, giving full personal particulars, details of training, experience, &c., and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

**WALSALL GENERAL (SISTER DORA) HOSPITAL.** (181 Beds.) Applications are invited for the appointments of HOUSE SURGEONS (2). This is an acute general hospital situated in a densely populated industrial area and gives wide experience in all branches of medicine and surgery. Posts recognised for pre-registration. Hospital recognised for F.R.C.S. Opportunities for experience in general surgery, orthopædics, gynæcology, and E.N.T. surgery. Married quarters available.

Applications, together with names of 2 referees, to Group Secretary, Walsall Hospital Management Committee, Walsall General (Sister Dora) Hospital.

**WALSALL GENERAL (SISTER DORA) HOSPITAL.** (181 Beds.) Applications are invited for the appointments of HOUSE PHYSICIANS (2). This is an acute general hospital situated in a densely populated industrial area and gives wide experience in all branches of medicine and surgery. Posts recognised for pre-registration. Duties mainly acute medical, with opportunities for additional experience in cardiology, chest diseases, diabetes and dermatology. Married quarters available.

Applications, together with names of 2 referees, to Group Secretary, Walsall Hospital Management Committee, Walsall General (Sister Dora) Hospital.

**WALSALL. MANOR HOSPITAL. (340 Beds.)** Applications are invited for the appointment of PÆDIATRIC HOUSE PHYSICIAN. The above Hospital is an acute general hospital situated in a densely populated industrial area, and gives wide experience in all branches of medicine and surgery. Post recognised for pre-registration. Children's ward, modern baby unit and premature unit attached to maternity unit.

Applications, together with names of 2 referees, to Group Secretary, Walsall Hospital Management Committee, Walsall General (Sister Dora) Hospital.

**WARLINGHAM PARK HOSPITAL, Warlingham, Surrey.** SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital is well known for its active and progressive inpatient practice. It also runs in the County Borough of Croydon a varied and almost complete community psychiatric service, including child-guidance clinic, day centre, therapeutic social clubs, evening group-therapy sessions, numerous adult outpatient clinics, &c. It is recognised for training for the D.P.M. and has a good psychiatric library. Single accommodation is available. Applicants may visit the Hospital by arrangement with the Physician-Superintendent.

Application forms, available from the Group Secretary, are returnable within 1 week from the date of this advertisement.

**WATFORD AND DISTRICT PEACE MEMORIAL HOS**PITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiology required for the above Hospital. Post recognised for the D.M.R.D. Hospital may be visited by direct appointment. Post vacant 18th July, 1960.

Application forms obtainable from and returnable by not later than 2nd July, 1960, to the Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts.

**WELSH REGIONAL HOSPITAL BOARD. Locum Tenens** REGISTRAR in Infectious Diseases required Lansdowne Hospital, Cardiff, immediately for approximately 3 months.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

**WELSH REGIONAL HOSPITAL BOARD.** Senior REGISTRAR to serve the North Wales Child Guidance Clinics, Central clinic, and proposed residential treatment unit, at Colwyn Bay, other clinics serving North Wales area. Establishment (full-time) of Consultant, Registrar, Child Therapist, 2 Psychologists, and 4 Psychiatric Social Workers. Experience of child-guidance work and a dynamic approach necessary. Further information available upon request. Visit to clinics by arrangement with the Consultant-in-charge. Subject to review annually.

Application forms (12 copies) from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

**WELSH REGIONAL HOSPITAL BOARD.** Registrar in Neurosurgery, Glantawe Hospital Management Committee. Based at Morriston Hospital, near Swansea, and may also be expected to serve other hospitals in the Group. This neurosurgery centre serves the whole of South West Wales and affords excellent experience. Resident/non-resident. Subject to review end of first year.

Forms of application from the Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff, within 14 days.

**WELSH REGIONAL HOSPITAL BOARD.** Surgical REGISTRAR (orthopædics) at Prince of Wales Orthopædic Hospital, Rhydlafar (270 Beds), serving Cardiff Hospital Management Committee. Hospital is Regional Orthopædic Centre for South Wales area. Married accommodation available. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

**WELSH REGIONAL HOSPITAL BOARD.** Registrar (general surgery), Pembroke County War Memorial Hospital, Haverfordwest. Resident/non-resident. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

**WELSH REGIONAL HOSPITAL BOARD.**

REGISTRAR (infectious diseases), based Hill House Isolation Hospital, Swansea (120 Beds, including beds for fever, gynæcology, tuberculous meningitis and primary tuberculosis), to serve Glantawe Hospital Management Committee. The Hospital is a sub-regional centre for the treatment of bulbar poliomyelitis and tuberculous meningitis. The post offers excellent opportunities for postgraduate study. Resident.

REGISTRAR (obstetrics and gynæcology). Based East Glamorgan Hospital, Church Village; expected to visit other hospitals in group. Resident. Vacant 21st September, 1960.

REGISTRAR in Thoracic Medicine, Sully Hospital, Sully, near Penarth, Glam. (318 Beds.) Regional Centre for all chest conditions, including heart diseases. Special interest in heart diseases desirable for this post. Resident or non-resident.

REGISTRAR (pædiatrics), Neath General Hospital. Recognised for D.C.H. Resident or non-resident. Vacant 1st October, 1960.

REGISTRAR in Anæsthetics, based Bridgend General Hospital. Post recognised for F.F.A. R.C.S. Resident or non-resident.

REGISTRAR in Obstetrics and Gynæcology to serve hospitals in the Merthyr and Aberdare Hospital Management Committee area. Non-resident.

Subject to review end of first year.

Application forms (12 copies) from Senior Administrative Medical Officer, Temple of Peace and Health, Cathays Park, Cardiff.

**WEST BROMWICH AND DISTRICT HOSPITALS** MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

**Hallam Hospital, West Bromwich** (430 Beds)

SENIOR HOUSE OFFICER in General Surgery.

SENIOR HOUSE OFFICER in General Medicine.

These posts will be vacant 8th July, 1960.

Applications, giving names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee, Edward-street, West Bromwich.

**WEST BROMWICH AND DISTRICT HOSPITALS** MANAGEMENT COMMITTEE. Applications are invited for the following appointments (pre-registration):—

**Hallam Hospital, West Bromwich** (430 Beds)

1 HOUSE PHYSICIAN.

1 HOUSE SURGEON.

1 HOUSE OFFICER in Obstetrics and Gynæcology.

These posts will be vacant 8th July, 1960.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospitals Management Committee, Edward-street, West Bromwich.

**WEST BROMWICH AND DISTRICT HOSPITALS** MANAGEMENT COMMITTEE. Applications are invited for the following :—

**West Bromwich and District General Hospital** (144 Beds)

SENIOR HOUSE OFFICER in General Medicine.

This post will be vacant 8th July, 1960.

Applications, giving names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee, Edward-street, West Bromwich.

**WIGAN AND LEIGH HOSPITAL MANAGEMENT** COMMITTEE. BILLINGE HOSPITAL, near WIGAN. SENIOR HOUSE OFFICER in Psychiatry. The post offers good experience under Consultant Psychiatrist. Main centre at Billinge Hospital where there is an active psychiatric unit with modern treatment and over 300 admissions annually.

Applications, with names of 2 referees, to Secretary, Knowsley House, Wigan.

**WIGAN AND LEIGH HOSPITAL MANAGEMENT** COMMITTEE. E.N.T. REGISTRAR (resident or non-resident) with main duties at Royal Albert Edward Infirmary, Wigan. Married quarters available. Recognised F.R.C.S. and D.L.O.

Applications to Secretary, Wigan Infirmary, Wigan.

**WEMBLEY HOSPITAL, Wembley, Middlesex.** (132 Beds.) REGISTRAR in Surgery (Registrar grade) required. Vacant 15th July, 1960. Resident post. Fellowship desirable. Hospital recognised for diploma of F.R.C.S. Annual appointment. Staff of 6.

Application forms obtainable from and returnable to the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 9th July, 1960.

**WEST DORSET GROUP HOSPITAL MANAGEMENT** COMMITTEE. Locum SENIOR SURGICAL REGISTRAR required for holiday relief duties from 17th August to 5th September, 1960, inclusive. Salary £27 9s. per week, less deduction at £200 p.a. if resident.

Applications to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

**WEYMOUTH HOSPITALS. West Dorset Group Hospital** MANAGEMENT COMMITTEE. WESSEX REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (Registrar grade) required for Weymouth Hospitals, based at Weymouth and District Hospital. The appointment is tenable for 12 months from mid-October, with probable renewal for a further year. The post is suitable for taking the M.R.C.P. examination.

Application forms available from Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, and returnable by 4th July, 1960.

**WINDSOR. KING EDWARD VII HOSPITAL.** Registrar (Casualty Officer), resident or non-resident, required. There is an Accident Unit of 30 Beds at the Hospital and, with the Casualty Department, forms part of the Accident Service for the Windsor Group. Candidates should have had previous experience in the treatment of acute injuries.

Application form from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 30th June.

**WOKING. THE ROWLEY BRISTOW ORTHOPÆDIC** HOSPITAL, PYRFORD, WOKING, SURREY. (200 Beds.) Applications are invited for the posts of RESIDENT HOUSE SURGEON (Senior House Officer grade), vacant mid-July and mid-August. The posts are recognised for the F.R.C.S. examination and will include 1 session per week at St. Thomas's Hospital, London.

Applications should reach the Secretary within 14 days of the date of this advertisement.

**WOLVERHAMPTON. THE ROYAL HOSPITAL.** Pre-registration HOUSE OFFICER (general surgery). Vacancy early June and July. Recognised for F.R.C.S.

Apply, with copies of 2 testimonials, to the Secretary.

**WOLVERHAMPTON. THE ROYAL HOSPITAL.** Pre-registration HOUSE OFFICER (general medicine). Vacant early June and July.

Apply, with copies of 2 testimonials, to the Secretary.

**WOLVERHAMPTON. THE ROYAL HOSPITAL.** Senior HOUSE OFFICER (orthopædics) required. Vacant now. Post recognised for F.R.C.S.

Apply, with copies of 2 testimonials, to the Secretary.

**WORTHING GROUP HOSPITAL MANAGEMENT COM-**MITTEE. Applications are invited for the post of THORACIC MEDICAL REGISTRAR. Duties at Worthing General Hospital and Southlands General Hospital Outpatient Departments, and inpatient beds for chest diseases. Outpatient thoracic surgical clinic at Worthing Hospital. Bronchitis unit at Bognor Chest Hospital and tuberculosis beds at Aldingbourne Chest Hospital. Non-resident or resident at Worthing Hospital. Post vacant 1st September.

Forms of application, to be returned immediately, are available from the undersigned. A. V. OAKTON, Group Secretary.
129, Brighton-road, Worthing, Sussex.

**WORTHING HOSPITAL, Lyndhurst-road, Worthing.** WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners, or pre-registration candidates, for the posts of HOUSE PHYSICIAN and HOUSE SURGEON at this busy acute hospital, vacant 1st August.

Applications, stating age, qualifications, experience, nationality, together with copies of 2 recent testimonials, to Hospital Secretary. A. V. OAKTON, Group Secretary.

**WREXHAM. MAELOR GENERAL HOSPITAL. Mater-**NITY UNIT. (75 Beds.) Applications are invited for the post of HOUSE SURGEON in Obstetrics and Gynæcology at the above Hospital to commence 1st August, 1960. This Hospital is a Part II Midwifery Training School and deals with normal and abnormal midwifery.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, should be sent to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, within 14 days of the appearance of this notice.

**YORK. COUNTY, CITY, MILITARY (Civilian Wing),** and FULFORD HOSPITALS. (General hospitals of 266, 256, 60, and 149 Beds respectively, with full Consultant staff.) SENIOR HOUSE OFFICER in Anæsthetics, resident or non-resident, required from the end of May, 1960. Married accommodation available. Post is recognised for F.F.A. R.C.S. and D.A. Previous experience desirable but not essential.

Applications, giving age, experience, qualifications, nationality, and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

**YORK. COUNTY HOSPITAL.** (General hospital, 266 Beds, with full Consultant staff.) JUNIOR HOSPITAL MEDICAL OFFICER required for Casualty Department from the end of May, 1960. This post is resident or non-resident and recognised for the F.R.C.S. Married accommodation available.

Applications, giving age, experience, qualifications, nationality, and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

**YORK. CLIFTON HOSPITAL. (1150 psychiatric beds.)** JUNIOR HOSPITAL MEDICAL OFFICER required. Salary £886 12s. rising to £1229 16s. a year. House or single accommodation available.

Applications, with names of 3 referees, to Physician-Superintendent.

## Public Appointments

**LONDON COUNTY COUNCIL. Applications invited** from medical practitioners practising in Wandsworth area under National Health Service for appointment as VISITING MEDICAL OFFICER to Milton Close, 78, Swaffield-road, S.W.18, a home for 51 elderly blind people. £40 a year plus fees receivable from Executive Council in respect of residents and resident staff who may be on National Health Service list.

Particulars and form from Medical Officer of Health (D1/L/1590/6), County Hall, S.E.1, returnable by 4th July.

**MIDDLESEX COUNTY COUNCIL. Assistant Medical** OFFICER, whole-time, required in Area 4 (Finchley and Hendon). Duties concerned with the supervision of the health of mothers and young children and the School Health Service. Diploma in Public Health or in Child Health desirable. Previous local-authority experience an advantage. Salary within the scale, according to experience, £1150–£1640. Established, prescribed conditions.

Particulars, and names of 2 referees, to Area Medical Officer, Town Hall, Hendon, N.W.4, by 2nd July. Canvassing disqualifies. (Quote C.748L.)

**THE ROYAL BOROUGH OF KENSINGTON. Metropolitan** BOROUGH OF CHELSEA. Applications are invited for the post of DEPUTY MEDICAL OFFICER OF HEALTH of the Royal Borough of Kensington and the Metropolitan Borough of Chelsea. Applicants must be duly qualified medical practitioners and also hold the Diploma in Public Health. Salary within the scale £1935 p.a. rising by 1 annual increment of £76 13s. 4d. and 2 of £73 6s. 8d. to a maximum of £2158 6s. 8d. p.a., plus a car allowance at the rate of £130 p.a. Terms and conditions of appointment may be obtained from the Town Clerk of Kensington. Canvassing will disqualify.

Applications must be submitted to the Town Clerk of Kensington not later than 12 noon on 11th July, 1960.

J. WARING SAINSBURY, Town Clerk.

Town Hall, Kensington, W.8.

JOHN C. KITCHIN, Town Clerk.

Town Hall, Chelsea, S.W.3.

**BIRMINGHAM. CITY OF BIRMINGHAM EDUCATION** COMMITTEE. School Medical Officer. Applications are invited from registered medical practitioners (Men or Women) for appointment as SCHOOL MEDICAL OFFICER in the School Health Service. The possession of a D.P.H. or D.C.H. will be an advantage. Salary in accordance with Whitley Council scale of £1150–£60–£1510–£65–£1640 p.a. Appointment is subject to the appropriate superannuation act and to the passing of a medical examination.

Forms of application and further particulars are obtainable from the undersigned (stamped addressed envelope) and must be returned not later than 1st July, 1960. Canvassing disqualifies.

E. L. RUSSELL, Chief Education Officer.

School Health Service,
154–5, Great Charles-street, Birmingham, 3.

**CHESTER. CITY OF CHESTER. Assistant Medical** OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Salary £1150–£60–£1510–£65–£1640 p.a. Car allowance. Housing accommodation can be provided in suitable circumstances. Duties approximately half school work and half local health authority work. Possession of D.P.H. or D.C.H. advantageous.

Application forms from Medical Officer of Health, St. Martin's House, Chester, to whom they should be returned by 9th July, 1960. Canvassing either directly or indirectly will be a disqualification, and applicants must disclose in writing if they are related to members of the Council or senior officials.

**CUMBERLAND COUNTY COUNCIL. Applications are** invited for the appointment of ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. The successful applicant will be based on the central health department in Carlisle, and the post is designed to offer, in addition to clinical work, administrative experience to those embarking on a career in public health. Salary within the range of £1150–£1640.

Forms of application may be obtained from the Deputy County Medical Officer, 11, Portland-square, Carlisle, and should be returned by 30th June, 1960.

G. N. C. SWIFT, Clerk of the County Council.

The Courts, Carlisle. 2nd June, 1960.


**BE A DOCTOR IN**

**TODAY'S R.A.F.**

A general practitioner career in the R.A.F. is not only secure but progressive, with excellent opportunities for clinical practice in both junior and senior ranks, and for post-graduate courses. There are also opportunities for those with appropriate experience to specialise. General practitioners are assured of steady promotion to Wing Commander; recognised specialists to Group Captain. Promotion to higher ranks is by selection.

Initial appointment is normally to a gratuity-earning short-service commission (3–6 years) or to a pensionable commission for 16 years' service. Both men and women under 33 with full G.M.C. registration may be appointed to a commission.

Write for details to AIR MINISTRY M.A.1. (HO 715a), 1–6, Tavistock-square, London, W.C.1.


**DERBYSHIRE COUNTY COUNCIL. County Health** Department. ASSISTANT COUNTY MEDICAL OFFICERS OF HEALTH AND SCHOOL MEDICAL OFFICERS. Applications are invited from registered medical practitioners for whole-time superannuable posts. Vacancies exist in areas near to Heanor, Long Eaton, Alfreton and Clay Cross. The main duties relate to the School Health Service but include child welfare work, vaccinations, &c. Salary £1150–£60–£1510–£65–£1640. Car allowance. A scheme of allowances towards removal and lodging expenses in appropriate cases has been adopted. Canvassing disqualifies.

Particulars and forms of application are obtainable from Dr. J. B. S. MORGAN, County Medical Officer, County Offices, Matlock.

**DUNDEE. CORPORATION OF DUNDEE. Health and** Welfare Department. Applications are invited from registered medical practitioners, under 45 years of age, for the post of ASSISTANT MEDICAL OFFICER OF HEALTH for duties in connection with Health and Welfare Services. Preference will be given to candidates having a D.P.H. qualification. Salary and conditions of service will be in accordance with the Whitley scale. The appointment is superannuable and the successful candidate will be required to pass satisfactorily a medical examination.

Applications, stating age, qualifications and experience, and giving the names and addresses of 3 referees, should be lodged with the subscriber on or before 23rd July, 1960.

ROBERT LYLE, Town Clerk.

City Chambers, Dundee, Angus.

**FACTORY DOCTORS. Factories Acts, 1937 and 1948.** The following appointments as Appointed Factory Doctor are vacant. Apply to H.M. Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

| *District* | *County* | *Latest date for receipt of applications* |
|---|---|---|
| WROTHAM .. | .. KENT .. .. | .. 9TH JULY, 1960 |
| STRENSALL .. | .. YORK .. .. | .. 9TH JULY, 1960 |
| CASTLE DOUGLAS .. | KIRKCUDBRIGHT | .. 9TH JULY, 1960 |
| HINCKLEY .. | .. LEICESTER .. | .. 9TH JULY 1960 |

**LANCASHIRE COUNTY COUNCIL. Appointment of** ASSISTANT DIVISIONAL MEDICAL OFFICERS. Applications are invited from registered medical practitioners for appointment in:—

Chadderton Whitworth/Milnrow Ashton-under-Lyne and County areas near Eccles.

Possession of Diploma in Public Health desirable but not essential. Salary scale £1150–£1640, the commencing-point being determined according to experience. Assisted car-purchase scheme and car allowance in accordance with County Council scale.

Application forms and further particulars from County Medical Officer of Health, Serial 2548, East Cliff County Offices, Preston, to be returned not later than 6th July, 1960.

**LEICESTER. CITY OF LEICESTER. Assistant Medical** OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Applicants must be registered medical practitioners. Whitley Medical Council Committee C conditions of service and salary scale £1150–£1640 p.a. Medical examination for superannuation purposes. Appointment terminable by 3 months' notice.

Application forms, returnable by 5th July, 1960, from Medical Officer of Health, City Health Department, 1A, Grey Friars, Leicester.

**MONMOUTHSHIRE COUNTY COUNCIL. The Council** invites applications from duly qualified registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER. Possession of the D.P.H. or similar qualifications would be of advantage. The duties will mainly be the medical inspection and treatment of schoolchildren and infant welfare work. The salary will be at the rate of £1150 p.a. rising by annual increments of £60 to £1510 and then by £65 to £1640. The successful candidate will be required to act under the direction of the County Medical Officer, to devote his/her whole time to the work of the County Council and to reside in such place as the County Council may determine. The post will be subject to the provisions of the Local Government Superannuation Acts and Regulations, and to a satisfactory medical examination.

A schedule of duties to be performed, together with conditions of appointment and a form of application, can be obtained from the County Medical Officer, Cambria House, Caerleon, to whom applications, accompanied by copies of not more than 3 testimonials, are to be sent not later than 11th July, 1960.

VERNON LAWRENCE, Clerk of the Council.

County Hall, Newport, Mon.

**GOVERNMENT OF KENYA. Medical Officers with** qualifications registrable in United Kingdom required for general duties. Officers may be posted to any station in Kenya and during the earlier years of service will be expected to carry out general medical and surgical duties, including a varying amount of public-health administration. In most stations, even if remote from larger towns, it is possible to maintain interest in any particular branch of medicine or surgery to which the officer is attracted. 1 vacancy is for a lady doctor interested in child health and nutrition. Appointment may be on permanent basis with pension (non-contributory) or on contract with gratuity (taxable) payable on satisfactory completion of service. Salary in scale £1284–£2115 a year, starting-point determined by experience. 4 extra increments given to officers possessing F.R.C.S., M.R.C.P., D.P.H., or other approved higher qualification. Private practice permitted in certain stations at discretion of Director of Medical Services. Free return passages up to cost of 3 adult fares. Taxation at local rates. Government quarters with heavy furnishings, if available, at low rental. If not available house allowance payable. Local leave permitted and home leave granted after each tour of from 24 to 45 months. Educational facilities available.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/7/02).

**NOTTINGHAM. CITY OF NOTTINGHAM.** Health Services. SENIOR ASSISTANT MEDICAL OFFICER. Applications invited for this appointment from registered medical practitioners holding the Diploma of Public Health. Salary £1475–£65–£1800. The successful applicant will be given opportunities for administrative and practical experience in all services of the Health Department. Appointment superannuable and subject to the usual conditions.

Form of application to be obtained from Medical Officer of Health, Huntingdon-street, Nottingham, and to be returned to him, together with names of 2 referees, by 11th July, 1960.

T. J. OWEN, Town Clerk.

Guildhall, Nottingham.

## General Practice

*For an* **Executive Council post** *(England and Wales) apply on form* **E.C.16A** *obtainable from the council. Mark envelope "Vacancy".*

**READING EXECUTIVE COUNCIL.** Applications are invited from registered medical practitioners for a VACANCY which will arise on 1st October, 1960, on the retirement of a Woman practitioner in the central area of the borough. Classification Intermediate. List as at 1st April, 1960, 1533, including county patients. Probability of existing surgery accommodation being made available subject to negotiation of new lease. Applications on form E.C.16A to be received by the undersigned not later than Monday, 11th July, 1960.

N. W. AUSTIN, Clerk of the Council.

10, Gun-street, Reading, Berks.

## Hospital Services: Non-Medical Appointments

**GODALMING GROUP LABORATORY.** Biochemist (basic grade). Salary scale and conditions of service in accordance with Whitley Council regulations £570–£25 (4)–£670; higher rate of pay for candidates possessing certain qualifications.

Apply, giving names of 2 referees, to Group Pathologist, Group Laboratory, c/o St. Thomas's Hospital, Godalming, Surrey, not later than 2nd July, 1960.

**MANSFIELD HOSPITAL MANAGEMENT COMMITTEE.** NOTTINGHAMSHIRE. Whole-time BIOCHEMIST (non-medical) required for hospital biochemical work in the Mansfield Area Pathology Service. The salary is that of the National Health Service basic grade with a maximum of £1035 p.a., the commencing salary being dependent upon qualifications and experience.

Applications, stating age, qualifications, experience, and names of 2 referees, to be sent to Hospital Secretary, King's Mill Hospital, Sutton-in-Ashfield, Notts. Further particulars may be obtained from the Consultant Pathologist-in-charge at that Hospital.

**READING. ROYAL BERKSHIRE HOSPITAL.** Basic Grade BIOCHEMIST (graduate in chemistry or biochemistry) required to work in the Group Pathological Laboratory under the supervision of the principal Biochemist. Good opportunity for further training. Within the salary range £570–£1035 p.a. in accordance with Whitley Council scales and conditions of service.

Applications, together with names of 2 referees, as soon as possible to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading. Intending applicants are invited to visit the laboratory by arrangement.

**ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** The whole-time post of BIOCHEMIST to the Rochdale Group of hospitals is now vacant and applications will be considered at Senior or Basic Grade level according to qualifications and experience. The successful applicant will be required to work under the Consultant Pathologist and to carry out biochemical work for the hospitals and clinics of the Group. A new Department of Pathology with a Biochemical Laboratory has recently been opened. Further details may be obtained from the Group Pathologist, Birch Hill Hospital, Rochdale. Commencing salary dependent on qualifications and experience, rising to a maximum of £1550 p.a. (senior grade).

Applications should be made as soon as possible on forms obtainable from Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

## Miscellaneous

**CIBA**

seeks a MEDICAL ADVISER in its Clinical Research Division at Horsham.

Candidates should be of Senior Registrar or equivalent status and hold a higher medical qualification. Duties mainly the organisation of clinical trials in the United Kingdom. The work is particularly interesting and rewarding because leading physicians and medical scientists depend upon such a man for essential liaison with our laboratory research.

If you are interested in playing this important part in the future development of drug therapy and believe you have the necessary qualifications, clinical experience, and personality, we invite your application. Please include full details of education, medical background, medical or scientific publications, &c. Attractive salary to the right man. Contributory pension scheme.

Applications to Director of Clinical Research, CIBA LABORATORIES LIMITED, Horsham, Sussex.

**Required. Assistant Medical Officer (preferably under** 30 years of age) for large chemical factory in Yorkshire. Exceptional opportunities for young man keen on toxicology and general industrial medical problems. Salary according to qualifications and experience, minimum £1550 p.a.—Applications in writing to Staff Department, Imperial Chemical Industries Limited, Dyestuffs Division, Hexagon House, Blackley, Manchester, 9.

**MEDICAL OFFICER**

required for a leading British Company in Commonwealth West Africa.

Applicants should not be more than 35 years of age and should have had good all-round experience since qualifying.

Starting salary will be between £1800 and £2000 p.a., in accordance with age, qualifications and experience. In addition there are family allowances, free passages to and from West Africa, and free furnished quarters. Membership of pension fund is compulsory. Tours of duty will be about 18 months followed by leave on full pay.

Applications, giving full details of experience, should be made to the Principal Medical Adviser, Unilever House, Blackfriars, London, E.C.4, not later than 1st July.

**STANDARD-VACUUM OIL COMPANY**

has the following openings with an affiliated company in Sumatra, Indonesia, for staff from the United Kingdom:

GENERAL PRACTITIONERS

with approximately 3 years' practice for general duties in well-equipped hospitals and clinics. Experience in anæsthetics or obstetrics will be an advantage. Free housing. Salaries in excess of B.M.A. recommended scales.

For further information write to the Medical Director, Standard-Vacuum Oil Company, Africa House, Kingsway, London, W.C.2.

**Full-time Industrial Medical Officer required for group** of 40 small factories in Park Royal, N.W.10. Salary £1800–£100–£2100 p.a.

Applications by 10th July to Occupational Health Unit, Central Middlesex Hospital, London, N.W.10

**Senior Medical Officer required by British Contractor to** take charge 80-Bedded modern hospital in West Africa. Good surgical, medical and tropical diseases experience essential. An income of over £5000 p.a. is envisaged. Free married accommodation provided.—Write L.535 LPE, Romano House, 399/401, Strand, London, W.C.2.

**Assistant wanted at once for Birmingham Practice** (partnership of 3). No view. Furnished flat provided. Suit married man (no children). Car essential. Salary £1600–£1700 p.a.—Phone Erdington 1511, or write—Address No. 608, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

**Medical Officer required for Antarctic Whaling Expedition** leaving U.K. mid-October, returning mid-May, 1961. Age preferably over 30 and must have surgical experience. Salary £125 per month, all found—Applications, giving details of age, qualifications and experience, with copies of 3 recent testimonials, and names of 3 referees, to be sent to CHR. SALVESEN & Co., 29, Bernard-street, Leith.

**The World Health Organisation, Geneva, requires a** Scientific Editor.

Duties: Normal editorial duties, including responsibility for publications from manuscript to press, writing scientific and publicity material, and indexing.

Requirements: English mother-tongue; good reading knowledge of French; flair for writing; university degree or equivalent experience. Training in medicine or science, or editorial experience with a technical publisher, is desirable.

Initial 2-year contract with 1-year probationary period. Initial salary $6000 a year (pensionable, plus allowances), with annual $200 increments if work is satisfactory.

Short-listed candidates will be required to take an 8-hour written examination, to be held in London (and possibly elsewhere in Great Britain) at some date between 10th and 30th August, 1960.

Detailed curriculum vitæ should be sent to Chief, Personnel, World Health Organisation, Geneva, before 10th July, 1960. Applicants who do not hear from World Health Organisation by 31st July should assume that they are not considered suitable for the post.

**British Council, London, requires sub-editor for** *British Medical Bulletin*. Practical experience of work in medical bibliography and/or scientific publishing, wide knowledge of medical terms and accuracy in detailed work essential. Duties include marking all copy for printers and checking proofs. Salary £640 (age 22) to £755 (age 25), rising to £1140. Pension scheme with transfer arrangements.

Write, quoting G.4.LT(60) and enclosing stamped, addressed foolscap envelope, to Director, Recruitment Department, 65, Davies-street, W.1, for further particulars and application form to be submitted by 8th July.

**"Pregnancy Diagnosis by the Xenopus Method."** 24-hour service. Send specimens of urine and £2 2s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386-7).

**Papers for publication. Indifferent English spoils papers** and ruins reputations. If writing is an effort, you should enlist the aid of an experienced writer (M.D. Cantab.), who offers a rapid editing and re-phrasing service at reasonable rates.—Address No. 585, THE LANCET Office, 7, Adam Street, Adelphi, London, W.C.2.

**For Sale. Microscope (R. and J. Beck) in black and brass,** coarse and fine adjustments, triple nosepiece, square stage, spiral focusing, Abbe condenser and iris diaphragm, two eyepieces, ¼ in., ⅛ in. objectives; case, perfect condition.—Address No. 609, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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